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PUBLIC HEALTH REPORTS

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DISABLING ILLNESS AMONG INDUSTRIAL EMPLOYEES IN 1935 AS COMPARED WITH EARLIER YEARS

By DEAN K. BRUNDAGE, *Senior Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

This is a continuation of former reports [1] on the average frequency of new cases of sickness and nonindustrial accidents causing absence from work for more than 1 week, among members of a group of about 33 industrial sick-benefit associations and company relief departments reporting periodically to the United States Public Health Service.

As pointed out in previous reports, the reporting establishments are located east of the Mississippi and north of the Ohio and Potomac Rivers.

This report covers the experience for the year 1935 as compared with the 5-preceding years. The incidence or frequency rate is the ratio of the number of cases which began during the year to the number of years of membership, or, in other words, the average annual number of cases per 1,000 men expressed in terms of number of cases per 1,000 years of life under observation. None of the reports includes industrial accidents.

The rates presented in the tables are probably understatements of the frequency of sickness and nonindustrial accidents which render employees unable to work for 8 consecutive days or longer, because benefits are usually refused for disability on account of the venereal diseases, for illness resulting from the violation of any civil law, for the results of willful or gross negligence, and for certain other causes. Since these provisions existed throughout the years under comparison, the frequency rates are comparable.

The tables cover two groups of establishments. Group A is composed of all associations and companies which reported in the specific year regardless of whether they continued to report throughout the 5 years. Group B is composed of the 23 establishments which reported throughout the 6 years ending December 31, 1935.

DISABILITY AMONG MALE EMPLOYEES IN YEAR 1935 COMPARED WITH PRECEDING YEARS

In 1935, according to table 1, the frequency rates for sickness and nonindustrial accidents causing disability for 8 consecutive calendar days or longer were 85.1 and 82.6 cases per 1,000 men among group A and group B, respectively. The rates for 1935 are approximately

[1] For the record 1921 to 1929, inclusive, see Public Health Reports, vol. 47, no. 18, Apr. 29, 1932, pp. 935 1001.

9 percent higher than the rates for 1934, and 4 percent higher than for 1933. However, the rates in 1935 were not as great as the corresponding rates in 1930, 1931, and 1932. In spite of the increase over the low rates in 1933 and 1934, the incidence rate in 1935 was about 5 percent below the average for the years 1930–34.

TABLE 1.—*Frequency of specified causes of disability lasting 8 consecutive calendar days or longer among male industrial workers in various industries, by years, from 1930 to 1935, inclusive* [1] *(annual number per 1,000 men)*

Year in which disability began	Sickness and nonindustrial injuries [2]		Sickness		Respiratory diseases [3]		Sickness exclusive of influenza		Nonrespiratory diseases		Average number of men, all reporting establishments
	A	B	A	B	A	B	A	B	A	B	
1930	94.1	94.7	81.8	82.9	32.0	32.6	68.5	69.5	49.8	50.3	188,714
1931	94.6	94.0	82.2	82.2	34.9	35.2	63.3	62.9	47.3	47.0	171,694
1932	97.5	95.3	84.9	83.5	37.6	37.3	62.9	61.5	47.3	46.2	163,979
1933	82.3	78.8	71.0	68.5	28.6	26.8	55.7	54.6	42.4	41.7	152,203
1934	78.1	76.3	65.8	64.4	24.5	24.0	55.7	54.2	41.3	40.4	174,643
1935	85.1	82.6	73.9	71.5	29.3	28.2	61.2	59.3	44.6	43.3	157,959
5 preceding years [4]	89.3	87.8	77.1	76.3	31.5	31.2	61.2	60.5	45.6	45.1	170,247

A=all reporting establishments; B=establishments which reported throughout the 6 years ending Dec. 31, 1935.

[1] For the record 1921 to 1929, inclusive, see Public Health Reports, vol. 47, no. 18, Apr. 29, 1932, pp. 995–1001.

[2] Industrial accidents, venereal diseases, and a few numerically unimportant causes of disability are not reported.

[3] Title numbers 11, 23, 104–115a, in the International List of the Causes of Death, fourth revision, Paris, 1929.

[4] 1930 to 1934, inclusive.

The rates for sickness, respiratory diseases, sickness exclusive of influenza, and nonrespiratory diseases, respectively, in 1935, as compared with former years, for groups A and B, showed relatively the same percentage increase. In each group the 1935 rates exceeded the rates for 1934 and 1933, but were below each of the first 3 years under consideration. The increase in frequency rates apparently was not due to any one particular disease group, but to a general increase in disability.

TREND IN THE FREQUENCY OF RESPIRATORY DISEASES AMONG MALE EMPLOYEES

Of particular interest is the frequency of cases of influenza or grippe. (See table 2.) The frequency of influenza in 1935 was lower than in 1933 and the preceding years under comparison; it was 20 to 23 percent below the average rate for the 5-year period, this decrease being relatively greater than for any other disease or disease group.

TABLE 2.—*Frequency of specified respiratory diseases which caused disability for 8 consecutive calendar days or longer among male industrial workers in various industries, by years, from 1930 to 1935, inclusive*[1] *(annual number per 1,000 men)*

Year in which disability began	Influenza or grippe (11)		Bronchitis, acute and chronic (106)		Diseases of the pharynx and tonsils (115a)		Pneumonia, all forms (107–109)		Tuberculosis of the respiratory system (23)		Other diseases of the respiratory system (104–105) (110–114)	
	A	B	A	B	A	B	A	B	A	B	A	B
1930	13.3	13.4	4.6	5.0	6.0	5.7	2.5	2.7	1.1	1.1	4.5	4.7
1931	18.9	19.3	3.6	3.8	5.2	5.1	2.1	2.1	1.0	1.0	4.1	3.9
1932	22.0	22.0	3.6	3.7	4.5	4.4	2.0	1.9	1.0	1.0	4.5	4.3
1933	15.3	13.9	2.9	2.8	3.9	3.6	1.8	1.7	.8	.9	3.9	3.9
1934	10.1	10.2	3.2	3.2	4.3	3.8	2.0	2.1	.8	.8	4.1	3.9
1935	12.7	12.2	3.6	3.6	5.1	4.8	2.3	2.2	1.0	1.0	4.6	4.4
5 preceding years	15.9	15.8	3.6	3.7	4.8	4.5	2.1	2.1	.9	.9	4.2	4.2

[1] For the record 1921 to 1929, inclusive, see Public Health Reports, vol. 47, no. 18, Apr. 29, 1932, pp. 995–1001.

A=All reporting establishments; B=establishments which reported throughout the 6 years ending Dec. 31, 1935.

Numbers shown in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.

The frequency of bronchitis (acute and chronic) in 1935 as compared with the preceding 5-year period was the same in group A and approximately the same in group B. However, in 1935 the rates were greater than in the 2 immediately preceding years. The rates for diseases of the pharynx and tonsils, pneumonia (all forms), and "other diseases of the respiratory system" not only exceeded the rates for the preceding 3 years, but also exceeded the average for the 5-year period. Mortality from pneumonia also increased in the industrial population of the country during 1935 as compared with 1934.[2] The rate of 2.3 new cases of pneumonia per 1,000 men is the highest observed for any year since 1930, when pneumonia occurred at the rate of 2.5 cases annually per 1,000 men.

The frequency of new cases of tuberculosis of the respiratory system was about the same as the 5-year average (1930–34).

TREND IN THE FREQUENCY OF DIGESTIVE DISEASES AMONG MALE EMPLOYEES

As shown in table 3, the diseases of the digestive system as a whole occurred at a slightly higher incidence level in 1935 than during the preceding 2 years. However, the rates 12.9 for group A and 12.5 for group B per 1,000 males in 1935 were somewhat lower than the corresponding rates for 1930, 1931, and 1932. In fact, with the exception of 1930, the rates for all digestive diseases show very little variation from year to year. The only subgroup of these diseases which showed rates in 1935 above the average for the preceding 5-year period was appendicitis. The frequency of appendicitis was

[2] Metropolitan Bulletin, Metropolitan Life Insurance Co., New Yok, vol. 17, no. 1, January 1936, p. 11

practically the same in 1935 as in 1934; however, a decrease in fatal appendicitis cases during 1935 is reported by the Metropolitan Life Insurance Co.

TABLE 3.—*Frequency of specified diseases of the digestive system which caused disability for 8 consecutive calendar days or longer among male industrial workers in various industries, by years, from 1930 to 1935, inclusive*[1] *(annual number per 1,000 men)*

Year in which disability began	Digestive diseases total (115b–129)		Diseases of the stomach except cancer (117–118)		Diarrhea and enteritis (120)		Appendicitis (121)		Hernia (122a)		Other digestive diseases (115b, 116, 122b–129)	
	A	B	A	B	A	B	A	B	A	B	A	B
1930	14.8	14.5	4.7	4.9	1.5	1.4	4.0	3.7	1.7	1.7	2.9	2.8
1931	13.4	13.1	4.0	3.8	1.2	1.1	3.7	3.6	1.8	1.8	2.7	2.8
1932	13.3	12.7	4.0	3.7	1.0	1.0	3.4	3.5	1.9	1.8	3.0	2.7
1933	12.1	11.3	3.3	3.4	1.0	1.0	3.3	3.2	1.3	1.3	3.2	2.4
1934	12.7	12.5	3.2	3.5	1.3	1.1	3.9	4.0	1.5	1.4	2.8	2.5
1935	12.9	12.5	3.6	3.6	1.1	1.0	4.0	3.9	1.4	1.4	2.8	2.6
5 preceding years	13.2	12.8	3.8	3.9	1.2	1.1	3.7	3.6	1.6	1.6	2.9	2.6

[1] For the record 1921 to 1929, inclusive, see Public Health Reports, vol. 47, no. 18, Apr. 29, 1932, pp. 995–1001.

A=All reporting establishments; B=establishments which reported throughout the 6 years ending Dec. 31, 1935.

Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.

TRENDS IN THE FREQUENCY OF NONRESPIRATORY, NONDIGESTIVE DISEASES AMONG MALE EMPLOYEES

In 1935 the frequency of nonrespiratory, nondigestive diseases was somewhat below the average for the 5 preceding years. The frequencies of 31.7 cases per 1,000 males for group A and of 30.8 for group B were lower than the respective rates for 1930, 1931, and 1932, but greater than the rates for 1933 and 1934.

Within this very broad class of diseases, however, certain subgroups showed rates which were not above those for any preceding year under consideration. Definite improvement appears to have occurred during the past 5 or 6 years in the number of new cases of rheumatism (acute and chronic) per 1,000 men, and in the rate of new cases of diseases of the organs of locomotion.

On the other hand, the incidence of diseases of the circulatory system except diseases of the veins duplicated in 1935 the high rate attained in 1932. Diseases of the heart appear to be largely responsible for the unfavorable rate for diseases of the circulatory system. (See table 4.)

TABLE 4.—*Frequency of specified nonrespiratory, nondigestive diseases which caused disability for 8 consecutive calendar days or longer among male industrial workers in various industries, by years, from 1930 to 1935, inclusive*[1] *(annual number per 1,000 men)*

Year in which disability began	Nonrespiratory, nondigestive diseases total		Diseases of the circulatory system except diseases of the veins (90-99) (101-103)		Diseases of the veins (100)		Diseases of the heart (90-95)		Nephritis, acute and chronic (130-132)	
	A	B	A	B	A	B	A	B	A	B
1930	35.0	35.8	3.4	3.6	1.6	1.7	2.1	2.3	0.7	0.8
1931	33.9	33.9	3.2	3.4	1.8	1.6	2.0	2.2	.7	.7
1932	34.0	33.5	3.7	3.9	1.8	1.7	2.5	2.7	.8	.7
1933	30.3	30.4	3.4	3.3	1.4	1.4	2.1	2.2	.5	.6
1934	28.6	27.9	3.0	3.0	1.5	1.4	2.0	2.0	.5	.6
1935	31.7	30.8	3.7	3.6	1.5	1.4	2.4	2.4	.5	.5
5 preceding years	32.4	32.3	3.4	3.4	1.6	1.6	2.1	2.3	.7	.7

Year in which disability began	Other diseases of the genito-urinary system and annexa (133-138)		Neuralgia, neuritis, sciatica (87a)		Neurasthenia and the like (87b)		Other diseases of the nervous system (78-85)		Diseases of the organs of vision (88)	
	A	B	A	B	A	B	A	B	A	B
1930	2.4	2.3	2.3	2.3	1.2	1.3	1.0	1.1	1.1	1.1
1931	2.3	2.3	2.1	2.1	1.5	1.5	1.1	1.3	1.0	.9
1932	2.3	2.3	2.3	2.5	1.3	1.2	1.2	1.3	.9	.8
1933	2.2	2.2	2.1	2.0	.8	.8	1.4	1.3	.8	.9
1934	2.4	2.1	1.8	1.8	.8	.7	1.4	1.1	.8	.7
1935	2.7	2.5	2.3	2.3	1.2	1.0	1.3	1.2	.8	.8
5 preceding years	2.3	2.2	2.1	2.1	1.1	1.1	1.2	1.2	.9	.9

TABLE 4.—*Frequency of specified nonrespiratory, nondigestive diseases which caused disability for 8 consecutive calendar days or longer among male industrial workers in various industries, by years, from 1930 to 1935, inclusive* [1] *(annual number per 1,000 men)*—Continued

Year in which disability began	Diseases of the ears and of the mastoid process (89)		Rheumatism, acute and chronic (56–57)		Diseases of the organs of locomotion except diseases of the joints (156b)		Diseases of the skin (151–153)		Infectious and parasitic diseases [2] (1–10, 12–22, 24–33, 36–44)	
	A	B	A	B	A	B	A	B	A	B
1930	0.5	0.5	5.6	5.8	3.5	3.6	3.8	4.0	3.8	3.5
1931	.7	.6	5.4	5.4	3.3	3.6	3.2	3.2	3.3	2.9
1932	.7	.6	5.3	5.4	3.3	3.7	2.7	2.7	2.7	2.1
1933	.6	.6	4.9	5.0	2.8	3.0	2.7	2.7	2.0	1.9
1934	.5	.5	4.0	4.0	2.7	2.9	2.5	2.4	2.5	2.5
1935	.6	.5	4.0	4.0	2.7	2.8	2.7	2.7	3.0	2.8
5 preceding years	.6	.6	5.1	5.1	3.1	3.4	3.0	3.0	2.9	2.6

Year in which disability began	Cancer, all forms (45–53)		Other general diseases [3] (54, 55, 59, 77)		Diseases of the bones and joints (154–156a)		Ill-defined and unknown causes of disability (200)		Nonindustrial injuries (163–198)	
	A	B	A	B	A	B	A	B	A	B
1930	0.5	0.5	1.2	1.1	0.7	0.7	1.7	1.9	12.3	11.8
1931	.6	.6	1.2	1.2	.6	.5	1.9	2.1	12.4	11.8
1932	.6	.6	1.7	1.7	.4	.4	2.3	1.9	12.6	11.8
1933	.5	.5	1.7	1.7	.5	.4	2.0	2.1	11.3	10.3
1934	.4	.4	1.9	1.9	.4	.3	1.5	1.6	12.3	11.9
1935	.5	.5	1.7	1.6	.5	.5	2.0	2.1	11.2	11.1
5 preceding years	.5	.5	1.5	1.5	.5	.5	1.9	1.9	12.2	11.5

[1] For the record 1921 to 1929, inclusive, see Public Health Reports, vol. 47, no. 18, Apr. 29, 1932, pp. 995–1001.
[2] Except influenza, respiratory tuberculosis, and the venereal diseases.
[3] Includes nutritional diseases, diseases of the endocrine glands, diseases of the blood and blood-making organs, chronic poisonings, and intoxications.

A = All reporting establishments; B = establishments which reported throughout the 6 years ending Dec. 31, 1935.
Numbers shown in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.

The year-to-year change in the incidence of other subgroups of nonrespiratory, nondigestive diseases may be seen in table 4.

FREQUENCY OF DISABILITY AMONG FEMALE EMPLOYEES IN 1935 AS COMPARED WITH FORMER YEARS

Table 5 shows the frequency rate of sickness and nonindustrial accidents for female industrial workers during 1935 as compared with former years, and with the male rate for each corresponding year.

Since the reporting establishments upon which this report is based employ approximately only 15,000 female workers, the rates for the broad disease groups alone are shown.

Since most of the reporting associations pay no benefits for disabilities connected with diseases of pregnancy, childbirth, and the puerperal state, and since the age distribution of the female group is

more favorable than that of the males, the ratio of the female rate to the male rate gives a rough approximation of the relation of sex to the incidence of disability.

TABLE 5.—*Frequency of specified causes of disability lasting 8 consecutive calendar days or longer among female industrial workers in various industries, by years, from 1930 to 1935, inclusive*

Year in which disability began	Sickness and nonindustrial injuries [1]	Percent of male rate	Sickness	Respiratory diseases [2]	Sickness exclusive of influenza	Nonrespiratory diseases	Nonindustrial injuries	Average number of women, all reporting establishments
1930	145.3	154	132.5	49.8	117.1	82.7	12.8	13,582
1931	162.0	171	147.8	63.9	115.5	83.9	14.2	12,272
1932	158.4	162	143.6	71.6	101.1	72.0	14.8	13,520
1933	131.3	160	119.5	51.3	91.4	68.2	11.8	14,587
1934	143.6	184	131.1	52.9	108.2	78.2	12.5	15,644
1935	144.9	170	130.7	50.4	108.2	80.3	14.2	15,049
5 preceding years [3]	148.1	166	134.9	57.9	106.7	77.0	13.2	13,921

[1] Industrial accidents, venereal diseases, and a few numerically unimportant causes of disability are not reported.
[2] Title numbers 11, 23, 104–115a, in the International List of the Causes of Death, fourth revision, Paris, 1929.
[3] 1930 to 1934, inclusive.

In 1935 among the female members of the reporting benefit associations the annual frequency of cases of sickness and nonindustrial accidents causing disability for 8 calendar days or longer was 144.9 cases per 1,000 females. This rate slightly exceeded the rates for 1933 and 1934, but was about 2 percent below the average rate for the 5-year period, 1930–34.

Sickness exclusive of influenza in 1935 among the female employees occurred at the same rate as in 1934. The frequency of 108.2 cases was greater than the average rate for the 5 preceding years. With the exception of 1932 and 1933, when the rates dropped sharply, the nonrespiratory diseases as a whole have shown relatively little change during the 6 years under comparison.

The incidence of disability caused by nonindustrial accidents among the females slightly exceeded the rate among males; in fact, sex was less related to this kind of disability than to any other lasting 8 days or longer.

It was found that for all sickness and nonindustrial accidents the females were absent 8 consecutive days or longer from 54 to 84 percent oftener than the males. The excess of 70 percent in 1935 as compared with 66 percent indicates that the average incidence of disability among the female employees as compared with the males in the same establishments was somewhat greater in 1935 than during the 5 preceding years as a whole.

SUMMARY

1. The annual number of cases of sickness and nonindustrial accidents lasting 8 calendar days or longer among approximately 158,000 male industrial employees was higher in 1935 than in 1933 or 1934, but lower than for the years 1930, 1931, or 1932.

2. The increase in the frequency of disability in 1935 as compared with 1933 and 1934 was not due to one particular disease or disease group.

3. An important disease group which showed rates in 1935 *above* the average for the *preceding 5-year period as well as for 1934* was the group of diseases of the circulatory system, which included diseases of the heart but was exclusive of diseases of the veins.

4. An important disease which showed rates *below* the average for the preceding 5-year period but *above* the rate for 1934 was influenza or grippe. A favorable trend is indicated in the frequency of rheumatism (acute and chronic) and in diseases of the organs of locomotion.

5. Several disease groups of interest to industrial hygienists showed very little change during the past 6 years.

6. The frequency of cases of sickness and nonindustrial accidents causing disability for more than 1 week among approximately 15,000 female industrial workers was 144.9 in 1935, as compared with 148.1 in the 5 preceding years as a whole.

TOXICITY OF FRUIT SPRAYS

A Study of Lead Spray Residues in Iowa-Grown Fruit, with Reference to Manifestations in Consumers

By Ralph H. Heeren, Ph. D., M.D., and Helen B. Funk, M. S., *Department of Hygiene, Preventive Medicine, and Bacteriology, College of Medicine, Iowa State University*

INTRODUCTION

The regulations applicable to sprayed fruits and vegetables intended for interstate commerce do not afford protection against spray residues on such articles of diet distributed in intrastate commerce. As a consequence, State control appears to be necessary, although as yet only a few States have adopted regulatory measures. State measures thus far have consisted of a cooperative plan with the Federal chemists and field analysts (as is in effect in the States of Washington and Maryland) or the enactment of State laws which give the State department of health the power to enforce regulations for spray amounts. Only two States, Colorado and Michigan, have so far passed laws of this type. Geagley (*1*), discussing the need for State control of spray residues, says:

It is pertinent to point out that a survey made in several States of programs in force for the control of spray residue will show willful lack of appreciation as well as of definite action and policies along control lines.

Iowa has established no spray residue regulations and has done only a very limited amount of investigation as to actual lead loads carried on products grown within the State. While many of the apples grown in Iowa are grown by small-scale producers and are intended for the growers' own consumption, there are also orchards in all districts of the State where apples are grown commercially. It is the general practice among this latter group of producers to spray their crops. The usual number of sprayings required is not more than three, as the incidence of the codling moth is found to be lower here than in many States (*2*). Illinois, neighboring Iowa on the east, requires more frequent sprayings, especially in the southern and central portions of the State (*3*). The Iowa spray schedule generally followed sets the third (and as mentioned above usually the last) spray date for the first week in June. In States where heavier spraying is required, the schedule is extended later into the summer, and the fruit, being larger, thus receives a relatively greater amount of spray. Furthermore, early sprays may be expected to be removed from the fruit, at least in part, by the rains of May and early June.

CASE OF ARSENIC DERMATITIS FROM EATING UNWASHED SPRAYED APPLES

Notwithstanding these conditions of light spraying, Iowa-grown apples as they appear on the market frequently show a definite coating upon them which strongly suggests spray residues. That poisoning has resulted from the ingestion of even small numbers of unwashed sprayed apples has been definitely demonstrated. The following summary of a case of arsenic dermatitis treated at the University Hospital may be cited here:

Case report.—The patient, T. E. M., male, aged 26, while on a vacation trip, ate three apples which he had picked from a roadside orchard. He stated that they were covered with a whitish spray substance which he partially removed with a handkerchief. On the following day diarrhea occurred, with 7 stools, and continued for a second day, with 4 stools. These stools were brown in color and contained mucus, but showed no gross evidence of blood. With the disappearance of the diarrhea, an anal itching developed which persisted to the time of admission to the hospital on the twenty-second day following ingestion of the fruit. Four days subsequent to the occurrence of the pruritis, a dermatitis appeared in the same area. It spread rapidly to include the entire buttocks, was urticarial in character, and showed an elevated margin. Proctoscopy at the time of admission to the hospital was negative. Two days following admission, an itching maculo-papular rash appeared in the lumbar region and within 24 hours extended to include the entire trunk and extremities. At this time the temperature dropped to a subnormal level. Two days later the rash began to fade and the patient started an uneventful recovery. Pulse and respiration at no time varied much

from normal. Arsenic was found in the urine on the day following admission. None was contained in the patient's hair. On the same day blood studies revealed 85 percent hemoglobin, a red count of 4,830,000, and a white count of 6,900, with 61 percent neutrophiles, 8 percent eosinophiles, and 30 percent lymphocytes.

In addition to an occasional clinical case as cited above, it appeared that there might possibly be a greater incidence of subclinical manifestations among those who regularly use sprayed products, especially in those who do not trouble to remove the residues by washing. In Iowa the commercial apple crop is the crop which is most regularly sprayed. Therefore it has seemed of interest to us to ascertain (1) whether Iowa-grown apples carry amounts of sprays above or below interstate commerce allowances and (2) whether the ingestion of these apples over a period of months will cause clinical or subclinical manifestations of toxicity.

EXPERIMENTAL

A. DETERMINATION OF LEAD CONTENT OF APPLES

For this study apples from the following sources were used: (1) Sprayed apples from six east-central Iowa orchards scattered over a radius of about 50 miles surrounding Iowa City; (2) nonsprayed apples from the same territory used as controls for natural lead content; and (3) imported acid-washed sprayed apples.

Tests were made for lead content rather than for arsenic, or for both lead and arsenic, since, as has been pointed out by Frisbie (*4*), "a sample which complies with the tolerance for lead will be well within the limit for arsenic, except, of course, in those unusual instances when such insecticides as calcium arsenate are used." For lead loads on the surface of the apples the diphenylthiocarbazone colorimetric test was used as recommended by the United States Department of Agriculture (*5*). For determinations of lead contents of cores and flesh the materials were prepared and ashed according to the method used by Kehoe, Thamann, and Cholak (*6*), after which the procedure was the same as for surface lead load studies.

Care was taken to see that the reagents used were free from lead and arsenic. Since experience has shown that 1,400-gram specimens were the most practical for getting representative lots of fruit and for determinations which were not too low to be read with certainty, these amounts were used. For tests of surface lead loads the stem and calyx ends of the apples were first removed and placed in the funnel in which the apples were rinsed after having been subjected to the sodium oleate wash solution. In some instances tests were made using the whole apple, while in others skins, flesh, and cores were tested separately to ascertain their individual lead loads. The test preparations were matched colorimetrically with known standard lead values and readings were made on the basis of number of grains of lead per pound of fruit.

B. DETERMINATION OF POSSIBLE CHANGES IN RED BLOOD CORPUSCLES DUE TO TOXIC EFFECTS OF INGESTED LEAD

Formerly blood tests for detection of the absorption of clinical or subclinical amounts of lead were based on the appearance of punctate stippling of the erythrocytes as shown by Wright's stain. It has recently been pointed out by Jones (*7*), McCord, Holden, Johnson (*8*), and others that basophilic substances appearing in erythrocytes (due to presence of toxic agents in the bone marrow or to abnormal physiologic demands) may appear in the form of polychromatophilia, punctate basophilia, or reticular designs, and of these the punctate stippling is least frequently seen (*8*). Thus for our work a modified Manson's methylene blue stain was used, since McCord, Holden, and Johnson (*8*), in studying a series of about 8,000 blood slides, found that this stain yielded most consistent results in the detection of the effects of lead as revealed by the blood picture. Manson's stain as used by these workers shows any or all three of the forms of basophilic materials present in erythrocytes.

For our studies 37 persons who regularly ate uncooked sprayed apples were used as test subjects. In addition, a series of 23 guinea pigs fed apples from the same sources, in the place of other "green" or "fresh" food, were studied. Of the 37 persons followed, 23 were university women students who used imported apples, some eating regularly two a day. The remaining 14 persons used Iowa-grown sprayed apples. The test subjects ate the apples regularly from fall to late winter and early spring, when the blood studies were made. These examinations were purposely made late in the season, with the belief that cumulative lead effects, if present at all, would be most evident after the fruit had been used for several months.

RESULTS AND DISCUSSION

The diphenylthiocarbazone test for the determination of lead in spray residues proved satisfactory for this work. It tested lead amounts varying from 0.000 to 0.027 grain per pound, with easily distinguishable color differences grading from the green at the low end of the scale to the cherry red present with the high lead values. Samples from the same source yielded consistent results.

With the exception of a few instances, lead amounts were found to lie within the 1935 Federal tolerance of 0.018 grain per pound. All imported apples examined gave values definitely below this allowed maximum. Five lots of domestic apples, however, showed excess lead loads ranging from 0.024 to 0.027 grain. These apples were from three orchards, two of them in Iowa and one in Illinois. The Illinois fruit had received "very heavy sprays", but no reason could be ascertained for the excess loads on the lots from the two Iowa

orchards, since spray dates, amount of spray, amount of rainfall, and time of picking did not essentially differ for these orchards. Two samples of unsprayed apples from an orchard adjoining a much-traveled highway were also examined for lead content. It was thought that the exposure of the fruit to exhausts from automobiles using tetraethyl gasoline might result in detectable lead accumulations on the surfaces of the apples, but no evidences of lead were found.

TABLE 1.—*Lead content on skin surface of apples*

Source	Spray dates	Variety of apple	Sample no.	Lead, grains per pound	Average
I. DOMESTIC APPLES, SPRAYED					
A	May 5; May 20; June 2	Greening	1	0.009	0.0049
			2	.005	
			3	.008	
		Roman stem	4	.007	
			5	.010	
		Baldwins	6	.004	
			7	.003	
			8	.003	
			9	.008	
			10	.002	
			11	.004	
			12	.0085	
			13	.002	
B	May 3; May 15; June 3	Jonathan; Grimes Golden; MacIntosh	1	.002	.0078
			2	.0045	
			3	.001	
			4	.015	
			5	.015	
			6	.0085	
			7	.009	
C	May 15; May 25; June 3	King David	1	.007	.0065
			2	.007	
			3	.008	
			4	.007	
			5	.005	
			6	.005	
D	3 sprays, dates not registered.	Delicious	1	.0175	.0187
			2	.020	
E	May 7	Mixed cider apples [1]	1	.0005	.0165
	May 21	Roman Stem	2	.026	
	June 5	Iowa Blush	3	.024	
F	Received "heavy spraying".	Jonathans [2]	1	.027	.027
			2	.027	
II. IMPORTED APPLES, WASHED, SPRAYED					
G	Sprayed and washed by producer.	Delicious	1	0.0065	0.006
			2	.004	
			3	.009	
H	Sprayed and washed by producer.	Delicious	1	.005	.006
			2	.0075	
III. DOMESTIC APPLES, UNSPRAYED					
I	Unsprayed	Greening	1	0.000	0.000
			2	.000	

[1] These apples had been washed in preparation for the cider making.
[2] Grown in Illinois for home consumption.

Surface lead loads on Iowa sprayed apples averaged 0.0082 grain per pound. Tests on flesh and cores of domestic sprayed apples ranged from 0.005 to 0.006 grain of lead per pound. These are slightly higher values than those of 0.001 found for apples from the orchard which had never received spray. Since the latter orchard is located in a distinctly rural area, the value may be taken to represent lead amounts

due to natural lead content of the soil. This finding is slightly higher than that of Kehoe, Thamman, and Cholak (*6*), who reported a per pound equivalent of 0.0006 grain in drinking water and 0.0008 grain in green apples in a primitive region practically free from other than natural sources of lead. Examinations of drinking-water samples from 10 different sources (*10*) within the area in which the Iowa apples were obtained were as follows: One sample yielded 0.008 parts of lead per million, one sample 0.005, and eight were recorded as 0.000 (*11*). These findings of differences between the lead content of 0.001 in fruit from an unsprayed orchard and values of 0.005 to 0.006 (surface loads are excluded here) from sprayed orchards may be interpreted as representing an increased lead content due to cumulative amounts of spray lead in the soil. This difference might be expected to become greater in accordance with the number of years the orchard receives spray.

TABLE 2.—*Lead content of entire apple*

DOMESTIC SPRAYED

Source as listed in table 1	Variety of apple	Sample no.	Lead content in grains per pound: Removed by preliminary HCl wash	Removed by soap rinse	Present in flesh	Present in cores	Total amount	Average
A	Roman Stem	12	0.0085	0.002	0.001	0.0005	0.012	-------
C	King David	1	----------	.0065	.0025	.0015	.0105	0.011
		6	.005	----------	.006	.0005	.0115	
		8	.0100	.006	.001	.0005	.0175	
D	Delicious	1	----------	.0175	.001	.0005	.019	.0200
		2	----------	.020	.003	.0005	.0235	
		1[1]	----------	.0005	.0005	.0005	.0015	
E	Mixed cider apples	2	----------	.024	.002	.0005	.0265	.0152
		5	.0120	.005	.0005	.0000	.0175	
F	Johnathan	14	----------	.027	trace	trace	.027	.027
		15	----------	.027	trace	trace	.027	

IMPORTED SPRAYED WASHED

Source as listed in table 1	Variety of apple	Sample no.	Removed by preliminary HCl wash	Removed by soap rinse	Present in flesh	Present in cores	Total amount	Average
G	Delicious	1	----------	.0065	.001	.0005	.008	0.0107
		2	.004	.009	.002	.0005	.0135	
H	Delicious	5	----------	.0075	.002	.000	.0095	.0112
			.006	.006	.001	.000	.003	

DOMESTIC, UNSPRAYED. ENTIRE APPLE USED

Source as listed in table 1	Variety of apple	Sample no.	Removed by preliminary HCl wash	Removed by soap rinse	Present in flesh	Present in cores	Total amount	Average
		3	----------	.000	--------	--------	.001	
I	Greening	4	----------	.000	--------	--------	.001	0.001
		5	----------	----------	--------	--------	.001	

[1] This lot of apples had been washed in preparation for cider making.

The 1935 Iowa "growing season" varied little from the average season, with about the usual amount of rainfall (see table 3) and with average temperatures (*9*), as opposed to the years of 1934 and 1936. Therefore it would appear that the surface lead loads found on the domestic apples are representative of the amounts to be expected over a period of years if present spraying schedules are maintained.

TABLE 3.—*Precipitation for growing season 1935 (9)*

Month	Rainfall in inches	Normal
April	1.67	3.06
May	5.78	4.19
June	7.91	4.66
July	4.97	4.16
August	3.80	4.06
September	3.72	3.96
October	1.20	2.78
November	4.06	2.11

As seen from table 2 much of the spray residue may be removed from the surface of the apples by a 1 percent hydrochloric-acid rinse. The rinse procedure followed is that outlined by the United States Department of Agriculture (*12*) and generally in use for preparation of sprayed apples entering into interstate commerce. However, as far as we are able to ascertain, Iowa apple growers who sell their products locally do not attempt to remove residues from the fruit nor is it the general practice among Iowa consumers to do so. Furthermore, Giebs (*13*) showed that home methods, such as rinsing the fruit in cold water or wiping with a cloth, are only partially effective in removing spray residues. In a study of 20 lots of apples, she found that rinsing the fruit in cold water reduced the lead load only from an average of 0.0123 grain to 0.0118 grain per pound, and that hand wiping with a cotton towel similarly reduced the lead content only to 0.0094 grain. It is to be noted that, while neither of these two simple procedures may be relied upon for adequate removal of heavy spray residues, the acid rinse can be carried out effectively. Moreover, the procedure is a simple one.

Of the 37 persons and 23 guinea pigs whose blood was studied for the presence of basophilic materials in the red corpuscles as an evidence of toxicity from lead, all gave negative findings. According to McCord, Holden, and Johnson (*8*), human beings normally do not show more than 1 percent of basophilic erythrocytes in the circulating blood. These authors further state that persons absorbing lead may have the percentage of these cells increased to 1.5 or 4.0 or higher before clinical symptoms of plumbism appear. None of our test subjects showed percentages of basophilic erythrocytes exceeding the 1 percent accepted as normal, even though they had regularly consumed the unwashed sprayed apples all winter. It was thought that the family of five regularly using the apples from source E would show red corpuscle changes, but none were present. Similarly, no test subject offered positive signs or symptoms of plumbism.

Although these studies suggest a lack of toxicity from ingestion of lead-spray residues, the question as to the possible injurious effects of long-continued daily consumption of fruits carrying lead residues still arises.

SUMMARY

1. A case of arsenic dermatitis is reported in an individual who ate apples covered with heavy spray residues.

2. Examinations for lead in spray residues on Iowa apples of the 1935 crop showed a lead content generally lower than the maximum allowed by Federal regulations for apples entering into interstate commerce, although two lots from Iowa orchards showed a higher lead content.

3. Imported apples which were examined also showed a lead content much lower than the maximum amount permitted by interstate commerce regulations, with the exception of one lot from an Illinois orchard.

4. Tests on apples from orchards receiving light sprays, as are customary in Iowa, show lower lead determinations than do crops from districts receiving heavier sprays.

5. The lack of increase of basophilic substances in the red blood corpuscles of individuals who ate sprayed apples regularly indicates that the amounts of lead ingested were not sufficient to produce signs of toxicity.

RECOMMENDATIONS

1. Although signs of toxicity were not found by blood tests in persons who ate sprayed apples regularly, some lots of apples exceeded the Federal lead tolerance, and one case of arsenic poisoning is presented; therefore, it is believed that growers who spray their fruit should make use of the 1 percent hydrochloric acid rinse, which is a simple procedure and would at least mitigate a potential danger.

2. Apple-growing States should enact laws giving the State department of health regulatory power to protect consumers against spray residues.

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(10) Personal report from Iowa State Planning Board, Project no. 968.

(11) The "dithizone" (diphenylthiocarbazone) method as given in Standard Methods of Water Analysis, 8th edition, p. 242, 1936, was used in these determinations.

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SIX YEARS' INTENSIVE OBSERVATION ON THE SEASONAL PREVALENCE OF A TICK POPULATION IN WESTERN MONTANA

A Preliminary Summary [1]

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This paper summarizes the results of quantitative studies of an adult tick population, *Dermacentor andersoni*, on a 40-acre tract in the Bitterroot Valley, Mont., over a period of 6 years, 1930 to 1935, inclusive. As observations of biotic activities under natural conditions are included, it is necessary to preface the report with a few general remarks on tick activities and methods of study.

PERTINENT FACTS CONCERNING D. ANDERSONI IN GENERAL

The habits of this tick have been referred to in numerous publications, the latest notable contribution being that of Cooley (1932). It may be stated that 2 years is usually required for completion of the life cycle from oviposition to the mature adult. The immature larval and nymphal stages infest rodents and small animals chiefly, while the adults feed mostly on large animals and man. Molting between these stages occurs off the host; and this tick is thus known as a 3-host tick even though the same animal species, such as the Columbian ground squirrel, serves both the larval and nymphal stage of an individual tick. Little is known concerning the habits of the unfed, or "flat", larvae and nymphs preceding infestation of hosts in nature. The activity of unfed adults, on the other hand, has been abundantly observed and subsequent remarks will refer chiefly to this stage. The season of prevalence, or "tick season", lasts from the first open weather and disappearance of snow until late June or early July, during which time the active adults are to be found on the tips of the low vegetation, usually not more than about 2 feet off the ground. They have been observed in outside "hibernation cages",

[1] From the Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont. Read before the St. Louis meeting of the American Society of Parasitologists, Jan. 2, 1936.

i. e., under confined but exposed conditions, to survive into the third season without feeding, and there is little reason why this could not occur in nature. As shown later, the longest survival of unrestricted marked ticks in the open has been two full "seasons"; but, as most of the engorged nymphs molt the season before they are ready to feed as adults, this would mean observed survival into the third year in the unfed adult condition.

METHODS

Collections were made by the method of tick "dragging", the drag consisting of a piece of white outing flannel approximately a yard square tied to the end of a light, 5-foot pole, like a flag. This was dragged over low vegetation in such a manner that an estimated 5-foot, "zig-zag" swath was covered in the line of travel. The active, adult tick population was thus sampled on a surveyed 40-acre tract of representative tick-infested country along five straight, equidistant lines or crossings. No deviations were allowed for such topographic features as game trails, fallen timber, or thickets, so that the sample could be considered average for the whole area. On the basis of proportionate space sampled (approximately 16,500 square feet) it was estimated that very close to 1 percent of active ticks on the area were represented in each day's catch.

Records for each collection included time of day, elapsed time of actual collecting operations by stop watch to standardize rate of travel (experience established as optimum, 20 minutes per crossing not including time for release of ticks from flag), soil surface and 4-foot air temperatures, wind velocity by Tycos anemometer, observed weather conditions, and host incidence by numbers of animals and game birds seen or by fresh sign. As details of these observations and data will be presented later, only incidental reference is included in this summary.

Sampling was repeated over exactly the same line of travel marked by blazes or landmarks so that the seasonal trends would be on a comparable basis. Initial draggings varied in different seasons with weather conditions and accessibility, which accounts for the fact that some ticks were already out of hibernation by the time of the first visit. These initial dates were April 17, 1930, April 15, 1931, March 31, 1932, April 4, 1933, February 14, 1934, and April 18, 1935. In order to maintain the tick population as nearly undisturbed as possible, ticks were released as soon as caught. The rate of progress was standardized by use of a stop watch and a mechanical counter facilitated keeping track of tick totals. The value of this procedure is at once realized when it is mentioned that an average of as many as seven ticks per minute were recovered on one crossing in 1930.

Many of the same ticks were repeatedly taken as the season progressed, determined by "tipping" the body of early captured ticks with a spot of enamel paint. The use of a different color each year made it possible also to check the number of seasons of reappearance of such specimens as subsequently reappeared on the crossings. Care was exercised to see that such spots were not extensive enough to interfere with the natural activities of the ticks.

OBSERVATIONS

Snow was still on a considerable portion of the upper and lower crossings on the initial dates of sampling in 1932, 1933, and 1934.

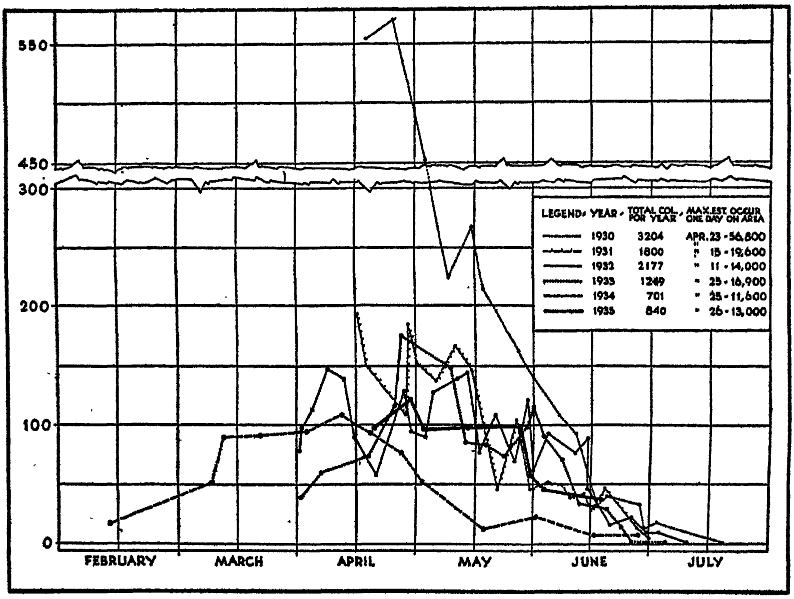

FIGURE 1.—Seasonal incidence of the Rocky Mountain wood tick in the Como area of western Montana, 1930–1935, inclusive.

Many ticks appeared on dead grass stems and weed stems in isolated patches from which the snow was just disappearing. In order to obtain a complete perspective of occurrence it would therefore be necessary to start operations as soon as the snow began to disappear on any part of the area, but thc present data are sufficiently comprehensive for practical purposes. Incidence for the several years is plotted in figure 1. In some respects the curve for 1933 presents the most satisfactorily complete trend of the 6 years considered. This was undoubtedly because the appearance of ticks from hibernation was retarded by a cold and "backward" spring that year. On the other hand, less sudden, presumably dispersing, influence of an early, open spring is seen in the low curve for 1934.

The maximum number of ticks taken in any one day was 568, on April 23, 1930. Based on the estimate of 1 percent catch of total ticks on the area, the calculated population at that time would have been 56,800 ticks on the 40-acre tract, or some 1,420 ticks to the acre. Calculated on the same basis, the comparative maximum population over the whole 40-acres in 1931 would have been 19,600 on April 15; in 1932, 14,000 on April 11; in 1933, 16,900 on April 25; in 1934, 11,700 on April 11; and in 1935, 13,000 on April 26. The total actual catches on the five crossings for each of the 6 years were as follows: 1930, 3,063; 1931, 1,770; 1932, 2,168; 1933, 1,249; 1934, 701; and 1935, 840. The least maximum, single day's sample as well as the smallest seasonal total, occurred in 1934. Over three and one-half times as many ticks were taken through the first season (1930) as through the last (1935), whereas the greatest (1930) and least (1934) single maximum collections showed a difference of nearly five times the number of ticks concerned.

It was at first thought that this progressive and marked drop in tick population might be due to a decrease in animal hosts. The area was unfortunately included in the county rodent-control operations the first 2 years by mistake. However, the animal counts do not show sufficient differences to account for so marked a decrease. The presence of wild game (deer, elk, and occasional moose) or range cattle was almost continuous within the area, indicated by fresh sign or by actual discovery, and other local experience indicated an abundance of adult tick hosts each year. Ground squirrels (*Citellus columbianus*) and chipmunks (*Eutamias amoenus*) constitute the chief hosts of the immature stages on the area with presence, probably negligible, of occasional pine (*Sciurus hudsonicus*) and sidestripe (*Callospermophilus lateralis*) squirrels. The importance of mice on the area is unknown. The rodent counts are relative at best, but sufficiently comparable to indicate population trends. The averages per day through the season for the 6 years were respectively: Ground squirrels—0.3, 1, 1.5, 2, and 1.5; chipmunks—2, 6, 3.3, 3, 1.5, and 1.7. From this it is not clear how the yearly incidence of either the large or small animal hosts was sufficiently variable to have affected the local tick population adversely, although the status of the rodent population preceding 1930 was not determined and might have been important.

It is remarkable that, in spite of considerable variation in field conditions and weather of the several springs, the maximum for each year occurred within the 2 weeks of April 11 to 25, progressively decreasing thereafter, with a marked drop during the second week in June and practical disappearance by early July. No comparable quantitative figures are available for *Dermacentor variabilis*, the common wood tick of the East, but empirical observations are available

showing much later seasonal prevalence, with maxima probably in June, which may be an important factor in the later seasonal incidence of Rocky Mountain spotted fever in the East compared with that in the West.

Experience indicates the violent irregularities in the curves (fig. 1) to be due chiefly to inclement dragging conditions, rather than variations in tick incidence on the vegetation. Strong or gusty wind, particularly, hampered operations by lifting the flag off the vegetation, and velocities of 400 to 600 feet per minute and over resulted in delayed or postponed sampling. While their reactions to passing "baits" are retarded during exposure to lowered temperatures or precipitation, ticks may nevertheless be seen still clinging to their perches on the vegetation. A considerable proportion appears to remain in position ready for opportunity of infestation during the night also, as indicated by a midnight collection in 1935. These midnight data compared with the adjoining diurnal observations were as follows:

Date, 1935	Time of start	Temperature		Wind velocity, feet per minute	Total ticks	Sex		Elapsed time, minutes	Painted ticks	
		Soil surface	Air			Male	Female		1934	1935
		° F.	° F.							
May 14	1 p. m.	60	70	180	94	47	47	101		6
May 16	Midnight	52	72	62	63	33	30	137	1	3
May 21	1 p. m.	82	80	168	103	54	49	101.5		6

"Painted" ticks, marked early in each season, were never taken in any great proportion during subsequent collections, but the scattering records are of interest. The last records for such ticks for each of the 6 years, were, respectively, July 8, June 4, June 10, June 22, June 5, and June 17, thus showing activity throughout the adult tick season on the part of some individuals. On the other hand, as many as 11 ticks marked at the beginning of 1930, were taken on April 17 a year later, with a noticeable decline of such ticks by May 5 but without a concomitant decrease of those marked earlier the same season (1931). This would possibly indicate early aestivation or death of some older individuals not finding hosts. While some depletion may be explained by host infestation and perhaps also by moderate migration off the crossings, consideration of persistence of certain marked younger specimens, repeatedly taken in the same isolated locations not readily accessible to larger animals was responsible for the opinion of early aestivation of older ticks. Certain marked individuals persisted in the same spot throughout several collections and became well known to the operator. In one interesting instance a tick marked early in April 1931 reappeared on the drag of April 6,

1932, and was then "double marked", a treatment accorded all similar ticks taken a second season. This tick was not recovered again for over a month and then it reappeared in the same spot on May 11. The location, sex, and type of "brand" marked this tick in the mind of the observer in the latter year.

Some adults in June appear to be freshly molted as though from nymphs engorged early in the same spring. It is not usual for such adults to be interested in feeding in both stages the same season. On four occasions partially fed females were also captured on the drag. These must have been dislodged from passing animals and were again seeking a host. It is known that such individuals, if infected, could effect rapid transfer of spotted fever if they should become attached to a human host. Flat nymphs were occasionally taken, but never larvae.

These records also have shown the sex ratios to vary with the lateness of the season. The early collections usually have a preponderance of males, but the proportions become reversed by June. Isolated records for 1932 may be cited: March 31—58 males, 24 females; April 24—52 males, 65 females; June 2—all 10 females; July 5—all 5 females. This observation is confirmed by counts of large numbers of ticks sampled at random in other localities, although usually some males are also taken late in the season.

Moderate concentration observed where crossings and game trails coincided confirmed previous random observations of such activity by several workers. Occasional draggings between crossings yielded no marked ticks, indicating not much disposition on the part of "disappointed" ticks to migrate for more than short distances. One would suspect that maximum stimulus to move would occur during this study by repeated disturbance of ticks along the crossings, as no care was exercised in releasing the ticks from the drag.

SUMMARY

Quantitative samples of an adult tick population (*Dermacentor andersoni*) on the vegetation of a surveyed 40-acre tract in the Bitterroot Valley, Mont., were made by the "dragging method", approximately biweekly or weekly, according to conditions, through the "tick-season" of 1930 and the five subsequent seasons. Repeated samples were taken over exactly the same straight lines of travel without regard to contour, game trails, changes in vegetational cover, or moderate inclemencies of weather; each sample yielded an estimate of one percent of active ticks on the area for the day, based on percentage of area covered. Recovered ticks were liberated as soon as taken. Ticks caught early in the season were touched dorsally with a drop of paint, a different color for each season, and by this means were found

to persist through at least two seasons in the unfed condition, although tremendously depleted in numbers through various natural causes by the second season. Males predominated in the early samples. Peaks of abundance occurred about the middle of April, while the beginning of hot weather in June resulted in rapid depletion of numbers so that by early July few or no ticks were taken on the crossings. Neither precipitation nor nightfall caused them to leave the vegetation, but moderate concentration on game trails was observed.

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DEATHS DURING WEEK ENDED DECEMBER 12, 1936

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 12, 1936	Corresponding week, 1935
Data from 86 large cities of the United States:		
Total deaths	8,790	8,713
Deaths per 1,000 population, annual basis	12.3	12.1
Deaths under 1 year of age	521	563
Deaths under 1 year of age per 1,000 estimated live births	47	52
Deaths per 1,000 population, annual basis, 50 weeks of year	12	11.4
Data from industrial insurance companies:		
Policies in force	68,870,782	67,807,743
Number of death claims	12,992	13,579
Death claims per 1,000 policies in force, annual rate	9.9	10.4
Death claims per 1,000 policies, 50 weeks of year, annual rate	9.7	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended December 19, 1936, and December 21, 1935

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 19, 1936, and Dec. 21, 1935

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935
New England States:								
Maine	4	2	7	1	53	255	1	0
New Hampshire					9	24	0	0
Vermont					1	79	0	0
Massachusetts	5	10			456	195	2	4
Rhode Island					158	122	0	1
Connecticut	2	7	3	7	116	76	0	2
Middle Atlantic States:								
New York	32	45	[1] 23	[1] 13	215	579	8	12
New Jersey	16	14	20	10	158	20	1	1
Pennsylvania	55	55			43	127	7	3
East North Central States:								
Ohio	45	37	5	9	22	52	8	3
Indiana	19	56	45	25	12		2	1
Illinois	37	73	113	34	27	20	9	4
Michigan	20	19		6	21	27	7	4
Wisconsin	1	3	86	55	34	75	0	2
West North Central States:								
Minnesota	15	3			25	54	1	1
Iowa	5	34	5		2	5	2	0
Missouri	10	46	85	96	7	15	1	2
North Dakota	1	2	3	2		14	0	0
South Dakota		9		1	1	2	0	0
Nebraska	8	9			3	17	0	2
Kansas	6	13	4	4	10	7	2	3
South Atlantic States:								
Delaware	12	2			53	102	0	0
Maryland [2]	10	20	14	35	128	41	7	5
District of Columbia	10	16		1	6	1	3	1
Virginia	36	26			46	22	7	4
West Virginia	19	33	109	43	43	3	1	3
North Carolina [3]	70	36	12	21	22	7	4	1
South Carolina	8	2	353	230	20		2	0
Georgia [3]	19	9	209	88			2	3
Florida [3]	12	11	9	4	3	1	3	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 19, 1936, and Dec. 21, 1935—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935
East South Central States:								
Kentucky	15	23	31	37	60	32	7	2
Tennessee	28	39	59	40	8	2	3	5
Alabama [3]	23	14	117	156	2	6	1	2
Mississippi [2]	10	3	-------	-------	-------	-------	0	1
West South Central States:								
Arkansas	4	8	23	52	-------	3	0	0
Louisiana	13	21	12	21	1	22	0	1
Oklahoma [4]	5	22	56	80	9	-------	3	8
Texas [3]	74	97	561	185	72	14	2	6
Mountain States:								
Montana	1	7	65	22	-------	20	2	0
Idaho	-------	-------	4	2	86	11	0	0
Wyoming	1	-------	-------	-------	-------	2	1	0
Colorado	4	11	1	-------	1	7	0	0
New Mexico	4	11	1	3	44	2	0	0
Arizona	4	5	93	47	72	-------	0	0
Utah [2]	-------	-------	-------	-------	70	-------	3	1
Pacific States:								
Washington	8	2	-------	-------	20	157	2	3
Oregon	1	9	39	23	9	323	1	1
California [3, 5]	49	33	58	40	28	302	9	6
Total	721	897	2,225	1,393	2,176	2,845	114	98
51 weeks of year	28,211	37,290	155,735	116,947	283,247	719,482	7,317	5,476

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935
New England States:								
Maine	0	2	24	17	0	0	1	3
New Hampshire	0	0	3	7	0	0	0	1
Vermont	0	1	2	11	0	0	0	1
Massachusetts	0	6	178	250	0	0	1	0
Rhode Island	0	0	38	31	0	0	0	0
Connecticut	0	0	57	40	0	0	3	1
Middle Atlantic States:								
New York	2	8	496	590	47	0	8	4
New Jersey	0	1	103	138	0	0	0	1
Pennsylvania	0	2	417	393	0	0	4	5
East North Central States:								
Ohio	5	1	274	288	2	1	4	4
Indiana	0	0	172	263	1	6	2	3
Illinois	1	3	423	593	0	2	5	6
Michigan	1	1	370	296	1	0	8	4
Wisconsin	1	0	257	445	6	8	1	1
West North Central States:								
Minnesota	1	1	140	301	11	5	2	1
Iowa	0	4	99	184	15	19	1	1
Missouri	0	0	101	192	3	4	10	3
North Dakota	0	0	25	67	13	3	0	0
South Dakota	1	0	76	53	10	6	0	3
Nebraska	0	0	43	249	1	20	1	0
Kansas	5	2	250	125	7	12	2	1
South Atlantic States:								
Delaware	0	0	22	19	0	0	0	1
Maryland [2]	0	1	69	101	0	0	8	15
District of Columbia	0	0	16	10	0	0	3	0
Virginia	1	1	39	50	0	0	6	4
West Virginia	0	0	77	75	0	0	6	2
North Carolina [2]	0	3	65	53	2	0	1	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 19, 1936, and Dec. 21, 1935—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935	Week ended Dec. 19, 1936	Week ended Dec. 21, 1935
South Atlantic States—Continued.								
South Carolina	0	1	6	5	0	0	2	1
Georgia [3]	4	0	31	20	0	0	6	3
Florida [3]	1	0	10	6	0	0	0	0
East South Central States:								
Kentucky	1	0	63	46	0	0	3	3
Tennessee	1	1	45	41	0	0	3	2
Alabama [3]	3	0	20	17	0	1	5	1
Mississippi [3]	0	0	13	21	0	0	3	0
West South Central States:								
Arkansas	3	0	17	13	0	0	0	2
Louisiana	1	1	16	12	0	0	8	9
Oklahoma [4]	4	0	11	36	0	0	2	8
Texas [3]	0	0	117	75	4	0	9	16
Mountain States:								
Montana	0	0	61	90	28	34	0	2
Idaho	0	0	48	45	0	0	3	0
Wyoming	0	0	12	80	1	3	0	0
Colorado	0	0	21	170	7	5	1	2
New Mexico	0	1	22	64	0	0	2	10
Arizona	0	0	15	30	0	0	1	0
Utah [3]	0	0	23	72	0	0	0	0
Pacific States:								
Washington	1	0	47	73	1	25	2	2
Oregon	2	2	43	47	29	1	2	3
California [3] [5]	6	9	306	280	2	8	6	8
Total	45	52	4,783	6,084	191	163	135	141
51 weeks of year	4,472	10,092	230,223	246,192	7,307	7,297	14,488	17,342

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 19, 1936, 32 cases, as follows: North Carolina, 2; Georgia, 13; Florida, 1; Alabama, 9; Texas, 6; California, 1.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Dec. 19, 1936, California, 1 case.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1936										
Idaho	7	7	16		151		1	125	4	17
Iowa	5	19	9		11		12	306	19	16
Louisiana	4	81	87	114	14	11	7	60	1	43
Maryland	25	74	31		175		4	271	0	27
Michigan	9	120	6	3	117		12	1,122	3	29
Nebraska	2	11			8		4	114	4	0
Nevada			29		2		0	48	0	3
New York	42	98		7	483		19	1,311	0	43
Ohio	17	178	68	2	54		33	1,235	2	52
Pennsylvania	20	155		3	162	3	23	1,329	0	104
Rhode Island	2	5			384		1	84	0	3
Vermont		1			4		1	32	0	2
Wisconsin	3	21	95		124		1	852	26	
Wyoming	1	2		2	8		1	64	6	

November 1936

Disease and State	Cases
Anthrax:	
New York	1
Pennsylvania	2
Chickenpox:	
Idaho	89
Iowa	386
Louisiana	7
Maryland	214
Michigan	1,835
Nebraska	98
Nevada	87
New York	1,788
Ohio	1,662
Pennsylvania	2,669
Rhode Island	99
Vermont	172
Wisconsin	1,637
Wyoming	103
Conjunctivitis:	
Idaho	12
Diarrhea:	
Maryland	25
Ohio (enteritis included)	20
Dysentery:	
Iowa (bacillary)	2
Louisiana (amoebic)	15
Louisiana (bacillary)	3
Maryland	36
Michigan (amoebic)	3
Michigan (amoebic carriers)	1
Michigan (bacillary)	8
New York (amoebic)	2
New York (bacillary)	62
Ohio (bacillary)	4
Pennsylvania (bacillary)	2
Rhode Island (bacillary)	1
Encephalitis, epidemic or lethargic:	
Idaho	2
Iowa	3
Maryland	1
Michigan	1
New York	5
Ohio	1
Pennsylvania	2
Wisconsin	2
Wyoming	1
German measles:	
Idaho	2
Iowa	1
Maryland	9
Michigan	36
New York	76

German measles—Contd.	Cases
Ohio	11
Pennsylvania	59
Wisconsin	46
Wyoming	5
Hookworm disease:	
Louisiana	8
Impetigo contagiosa:	
Idaho	13
Maryland	42
Michigan	3
Lead poisoning:	
Ohio	12
Leprosy:	
Michigan	1
Mumps:	
Idaho	32
Iowa	66
Louisiana	5
Maryland	260
Michigan	478
Nebraska	55
Nevada	5
Ohio	69
Pennsylvania	932
Rhode Island	24
Vermont	87
Wisconsin	499
Wyoming	46
Ophthalmia neonatorum:	
Maryland	1
New York [1]	6
Ohio	51
Pennsylvania	6
Wisconsin	3
Paratyphoid fever:	
Michigan	2
New York	12
Ohio	2
Puerperal septicemia:	
Ohio	5
Rabies in animals:	
Louisiana	15
Michigan	8
New York [1]	2
Scabies:	
Idaho	8
Maryland	1
Septic sore throat:	
Idaho	141
Iowa	2
Louisiana	3
Maryland	13
Michigan	33
New York	29
Ohio	67
Rhode Island	4

Septic sore throat—Contd.	Cases
Wisconsin	1
Wyoming	3
Tetanus:	
Louisiana	3
New York	5
Ohio	2
Pennsylvania	2
Trachoma:	
Idaho	12
Iowa	1
Pennsylvania	1
Rhode Island	1
Trichinosis:	
New York	13
Pennsylvania	1
Tularaemia:	
Iowa	9
Michigan	1
Ohio	7
Pennsylvania	2
Wisconsin	5
Typhus fever:	
Louisiana	1
New York	1
Undulant fever:	
Iowa	9
Louisiana	5
Maryland	1
Michigan	6
New York	25
Ohio	8
Pennsylvania	10
Rhode Island	5
Vermont	1
Wisconsin	4
Vincent's infection:	
Idaho	4
Maryland	6
Michigan	21
New York [1]	59
Whooping cough:	
Idaho	18
Iowa	136
Louisiana	24
Maryland	459
Michigan	928
Nebraska	27
Nevada	17
New York	1,088
Ohio	975
Pennsylvania	2,052
Rhode Island	67
Vermont	125
Wisconsin	568
Wyoming	6

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 12, 1936

This table summarizes the reports received weekly from a selected list of 110 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	1	------	0	0	5	2	0	0	0	2	28
New Hampshire:											
Concord	0	------	0	0	0	1	0	0	0	0	12
Manchester	0	------	0	0	2	1	0	0	0	0	15
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	0	------	0	1	1	0	0	2	0	1	4
Rutland	0	------	0	0	2	0	0	0	2	2	6
Massachusetts:											
Boston	0	------	1	4	10	43	0	12	0	224	221
Fall River	0	------	0	0	2	4	0	2	0	1	32
Springfield	0	------	0	0	2	3	0	1	0	8	35
Worcester	0	------	0	14	14	1	0	0	0	25	56
Rhode Island:											
Pawtucket	------	------	------	------	------	------	------	------	------	------	------
Providence	0	------	0	15	4	24	0	1	0	18	66
Connecticut:											
Bridgeport	0	1	0	29	3	1	0	2	0	6	40
Hartford	0	------	0	0	2	11	0	1	0	10	------
New Haven	0	------	0	0	2	2	0	2	0	2	29
New York:											
Buffalo	0	------	0	35	0	10	0	6	0	23	116
New York	34	14	7	56	126	124	0	88	6	72	1,533
Rochester	0	------	0	1	9	3	0	0	0	4	64
Syracuse	0	------	0	10	2	11	0	0	0	10	57
New Jersey:											
Camden	1	------	1	0	2	1	0	2	0	1	25
Newark	0	------	0	33	16	9	0	8	0	20	103
Trenton	1	1	0	0	0	6	0	2	0	0	20
Pennsylvania:											
Philadelphia	6	4	3	5	36	86	0	24	1	113	490
Pittsburgh	3	4	5	3	26	55	0	6	1	37	179
Reading	0	------	3	2	1	2	0	2	0	25	35
Scranton	0	------	------	1	------	6	0	------	0	0	------
Ohio:											
Cincinnati	3	------	1	1	19	7	0	9	0	7	144
Cleveland	5	17	1	2	21	42	0	12	0	35	213
Columbus	3	1	1	0	4	5	0	4	0	7	82
Toledo	1	------	0	1	2	3	0	8	0	15	78
Indiana:											
Anderson	0	------	0	0	0	4	0	0	0	1	9
Fort Wayne	2	------	0	0	1	6	0	2	0	0	27
Indianapolis	4	------	0	5	12	16	0	2	0	13	96
South Bend	0	------	0	0	2	2	0	0	0	4	13
Terre Haute	0	------	0	0	0	9	0	0	0	0	22
Illinois:											
Alton	1	------	0	0	1	4	0	0	0	0	6
Chicago	10	36	3	6	60	205	0	23	0	71	708
Elgin	3	------	0	0	0	0	0	0	0	17	4
Moline	0	------	0	0	1	0	0	1	0	2	8
Springfield	1	------	0	0	5	6	0	0	0	7	24
Michigan:											
Detroit	6	------	0	8	27	149	0	15	1	113	267
Flint	4	------	0	1	5	11	0	0	0	10	22
Grand Rapids	0	------	1	2	1	7	0	0	4	3	30
Wisconsin:											
Kenosha	0	------	0	0	1	2	0	0	0	4	10
Madison	0	------	0	1	0	5	0	1	0	7	20
Milwaukee	1	------	0	5	6	33	0	4	0	33	100
Racine	0	------	0	0	0	17	0	1	1	0	9
Superior	0	------	0	1	0	3	0	0	0	5	12
Minnesota:											
Duluth	0	------	0	0	0	22	0	0	0	0	22
Minneapolis	3	------	0	0	9	11	0	0	0	3	124
St. Paul	0	------	0	1	8	13	0	0	0	23	61

City reports for week ended Dec. 12, 1936—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0	------	------	0	------	1	0	------	0	3	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	0	------	15	0	------	0	0	47
Sioux City	0	------	------	0	------	13	3	------	0	0	------
Waterloo	2	------	------	0	------	2	0	------	0	10	------
Missouri:											
Kansas City	2	------	2	2	7	27	0	3	0	10	94
St. Joseph	------	------	------	------	------	------	------	------	------	------	------
St. Louis	13	------	0	1	11	35	0	10	2	34	224
North Dakota:											
Fargo	0	------	0	0	1	3	0	0	0	0	11
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	9
South Dakota:											
Aberdeen	0	------	------	0	------	1	0	------	0	0	------
Nebraska:											
Omaha	0	------	0	1	8	5	0	0	0	1	54
Kansas:											
Lawrence	0	2	------	0	0	1	0	0	0	0	7
Topeka	0	------	1	1	5	4	0	1	0	0	36
Wichita	0	------	0	0	9	5	0	1	0	0	34
Delaware:											
Wilmington	0	------	0	18	2	1	0	0	0	1	29
Maryland:											
Baltimore	3	8	0	96	29	21	0	14	1	124	221
Cumberland	0	1	0	1	3	0	0	0	1	0	20
Frederick	0	------	0	0	0	1	0	1	0	0	4
District of Columbia:											
Washington	5	2	2	1	22	10	0	12	1	31	189
Virginia:											
Lynchburg	0	------	0	1	1	1	0	2	0	0	20
Norfolk	0	3	0	1	2	5	0	1	0	0	21
Richmond	1	------	1	0	11	1	0	3	1	0	79
Roanoke	1	------	0	0	2	2	0	0	0	0	20
West Virginia:											
Charleston	0	------	0	0	1	0	0	0	0	0	23
Huntington	1	------	------	0	------	3	0	------	0	0	------
Wheeling	0	------	0	0	10	1	0	0	0	0	29
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	0	------	0	0	4	1	0	0	0	0	29
Wilmington	0	------	0	0	2	0	0	0	0	0	8
Winston-Salem	1	------	0	0	2	2	0	1	0	0	13
South Carolina:											
Charleston	1	26	0	0	7	3	0	3	0	0	27
Columbia	0	------	0	0	8	0	0	0	0	0	24
Florence	1	------	0	0	0	0	0	1	0	0	8
Greenville	1	------	0	0	5	1	0	0	0	0	15
Georgia:											
Atlanta	1	22	6	0	18	11	0	2	0	0	110
Brunswick	------	------	------	------	------	------	------	------	------	------	------
Savannah	0	90	5	0	6	0	0	0	0	2	56
Florida:											
Miami	0	------	0	1	1	0	0	2	0	0	29
Tampa	0	4	4	1	6	0	0	1	0	0	39
Kentucky:											
Ashland	0	------	------	0	------	0	0	------	0	0	------
Covington	0	------	0	0	3	1	0	1	0	0	20
Lexington	0	2	0	0	2	0	0	3	0	0	25
Tennessee:											
Knoxville	3	------	1	0	5	0	0	0	0	0	29
Memphis	1	------	0	0	5	8	0	4	0	7	96
Nashville	1	------	1	0	6	4	0	4	0	0	62
Alabama:											
Birmingham	1	10	0	1	12	3	0	5	1	1	85
Mobile	0	------	3	0	0	5	0	0	0	0	25
Montgomery	2	------	------	0	------	5	0	------	0	1	------
Arkansas:											
Fort Smith	1	------	------	0	------	8	0	------	0	0	------
Little Rock	0	------	0	0	7	0	0	1	0	0	8

City reports for week ended Dec. 12, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	0	0	0	2
New Orleans	1	5	4	1	32	0	0	10	2	0	160
Shreveport	0	------	0	0	10	1	0	2	0	0	51
Oklahoma:											
Oklahoma City	2	------	1	0	5	4	0	2	1	0	37
Tulsa	0	------	------	1	------	2	0	------	0	0	------
Texas:											
Dallas	6	3	3	1	9	14	0	1	0	2	64
Fort Worth	3	5	0	24	1	5	1	1	0	5	41
Galveston	0	------	0	0	2	0	0	0	0	0	14
Houston	3	------	1	0	9	4	0	4	0	0	86
San Antonio	2	------	1	0	12	0	0	9	0	0	73
Montana:											
Billings	0	------	0	1	1	2	0	0	0	0	11
Great Falls	0	------	0	0	1	0	3	0	0	0	7
Helena	0	------	0	0	2	3	0	0	0	0	7
Missoula	0	------	0	0	1	0	0	0	0	0	4
Idaho: Boise	0	------	0	0	1	3	0	0	0	0	11
Colorado:											
Colorado Springs	0	------	0	0	3	1	0	0	0	0	13
Denver	4	------	0	4	5	20	0	7	0	43	91
Pueblo	1	------	0	0	1	1	0	0	0	0	10
New Mexico: Albuquerque	0	------	0	2	3	7	0	6	0	0	19
Utah: Salt Lake City	0	------	0	2	7	13	0	3	0	5	44
Nevada: Reno	------	------	------	------	------	------	------	------	------	------	------
Washington:											
Seattle	6	------	0	4	12	5	0	5	0	1	108
Spokane	0	------	0	0	7	7	0	0	2	0	37
Tacoma	0	------	1	0	4	1	0	1	0	0	34
Oregon:											
Portland	0	------	2	2	9	6	1	2	0	7	82
Salem	0	------	------	0	------	1	0	------	0	8	------
California:											
Los Angeles	15	22	5	3	29	39	0	26	0	71	397
Sacramento	2	1	1	0	2	14	0	4	0	5	34
San Francisco	5	1	0	2	11	24	0	8	0	26	202

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Delaware:			
Boston	2	1	0	Wilmington	1	0	0
Rhode Island:				Maryland:			
Providence	2	0	0	Baltimore	4	0	1
New York:				District of Columbia:			
New York	9	8	0	Washington	1	1	0
Pennsylvania:				Tennessee:			
Philadelphia	1	0	0	Knoxville	0	0	2
Reading	1	0	0	Memphis	1	0	1
Ohio:				Louisiana:			
Cincinnati	0	1	1	Lake Charles	1	0	0
Cleveland	0	0	1	Oklahoma:			
Columbus	0	0	1	Oklahoma City	2	0	0
Toledo	2	0	0	Oregon:			
Illinois:				Portland	2	0	0
Chicago	0	0	3	California:			
Michigan:				Los Angeles	1	1	3
Detroit	5	3	1				
Missouri:							
St. Louis	0	0	2				

Encephalitis, epidemic or lethargic.—Cases: Columbus, 1.
Pellagra.—Cases: Charleston, S. C., 1; Savannah, 1; Memphis, 1; Dallas, 1.
Typhus fever.—Cases: New York, 1; Savannah, 1; Montgomery, 2; Galveston, 1.

FOREIGN AND INSULAR

SWEDEN

Communicable diseases—October 1936.—During the month of October 1936 cases of certain communicable diseases were reported in Sweden, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	10	Poliomyelitis	[1] 520
Diphtheria	103	Scarlet fever	874
Dysentery	48	Syphilis	35
Epidemic encephalitis	5	Typhoid fever	13
Gonorrhea	1,093	Undulant fever	21
Paratyphoid fever	61		

[1] Includes 98 cases nonparalytic at time of notification.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for December 25, 1936, pages 1803–1815. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued January 29, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Algeria—Algiers.—During the week ended December 12, 1936, one suspected case of plague was reported in Algiers, Algeria.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—A rat found December 18, 1936, in Paauhau sector, Hamakua district, Island of Hawaii, Hawaii Territory, has been proved plague infected.

Smallpox

Great Britain—England and Wales—London and Great Towns.—A report from London and Great Towns, England and Wales, Great Britain, for the week ended November 28, 1936, shows one case of smallpox in Oldham, Lancaster County.

Yellow Fever

Colombia—San Vincente de Chucuri.—On September 25, 1936, one fatal case of yellow fever was reported in San Vincente de Chucuri, Colombia.

Gold Coast—Tamale.—On December 17, 1936, one case of yellow fever was reported in Tamale, Gold Coast.

Senegal.—During the period November 20–30, 1936, yellow fever was reported in Senegal, as follows: One suspected case in M'Bour, and one suspected case in Thies.

x

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

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FURTHER STUDY OF THE DURATION AND COST OF FEDERAL COMPENSATION CASES WITH DISEASE AS A COMPLICATING FACTOR

Cases Classified Into Accidental Injuries, Occupational Diseases, and Hernias[1]

By WILLIAM M. GAFAFER, *Senior Statistician, United States Public Health Service*

INTRODUCTION

Analyses of compensation cases with reference essentially to duration and cost, and, in particular, analyses based on a classification of cases into those of accidental and nonaccidental origin, are of more than ordinary interest at the present time. The situation is thus, primarily, for the reason that the governing bodies of many States are confronted by the controversial question of whether a system of blanket or schedule coverage shall be adopted with respect to the compensation of injuries connected with occupational diseases. The Federal act providing for the compensation of the cases which form the subject matter of this inquiry was established in 1916 and has been continuously administered by the United States Employees' Compensation Commission. The act subscribes to blanket coverage in that the term *injury* as written into the act has been interpreted as including not only accidents as ordinarily defined, but also any bodily injury or disease due to the performance of duties and causing incapacity for work.

A previous paper (*1*), based on data made available by the United States Employees' Compensation Commission, dealt with the duration and cost of 1,337 compensation cases in which disease was a complicating factor. These cases occurring among civil employees of the United States Government were incomplete in the sense that they were still being compensated on December 31, 1935, and involved long-continued or permanent disability (both partial and total). In the present paper it is purposed to study the same collection of cases but with the use of a classification only casually introduced in the previous report, namely, a classification depending upon whether cases are of accidental or nonaccidental origin, the latter including those cases which involve what may be considered occupational diseases.

[1] From the Office of Industrial Hygiene and Sanitation, U. S. Public Health Service.

To familiarize the reader with the material, some of the results previously obtained are briefly summarized as follows: (1) Of the 1,337 incomplete cases with disease as a complicating factor, 71 percent were partially disabled while the remainder were totally disabled. (2) Almost 50 percent of the cases were compensated for injuries that occurred 10 or more years ago. (3) The total duration of the cases amounted to nearly 2.7 million days and was approximately equally divided between the partially and totally disabled groups. (4) The total compensation paid was over 7 million dollars; the average compensation paid per case was $5,343, and the estimated future cost of the cases was over 8 million dollars. (5) Regardless of the degree of disability, arthritis as a complicating factor easily ranked first with respect to the number of cases, total duration, and total compensation paid; general infections and tuberculosis ranked next as complicating factors. Particularly important in connection with the present paper is an additional finding; namely, of the 1,337 incomplete cases with disease as a complicating factor, 84 percent resulted from accidental injuries or were activated or aggravated by them; about 11 percent were of nonaccidental origin or involved what may be designated occupational diseases; and about 5 percent were accounted for by hernias.[2] The analyses to follow will be based on this classification, with emphasis principally on the relation of accidental to nonaccidental injuries with respect to severity of disability, duration, and cost. The relatively small number of hernias are included in the various tables for the sake of the completeness of the picture, and only occasionally will reference be made to them in the text.

With regard to the population exposed or the number of civil employees within the scope of the Compensation Act of 1916, it was estimated by the Commission that the number for a period of approximately 15 years prior to 1933 did not exceed 700,000. Since 1933 the number has increased to between 900,000 and 1,000,000.

Other pertinent information of an introductory and supplementary nature may be found in the recent paper to which reference has been previously made. Throughout the present paper it must be recognized that the data deal with incomplete cases in which disease is a complicating factor; *cases involving accidents only are not included.*

ANALYSIS OF THE DATA

Duration of cases and compensation paid.—The duration of the incomplete cases and the compensation paid, classified according to the kind of injury, are shown in table 1. The table, indicating the nature of the available material, is specific for the degree of severity

[2] "Hernia is, technically and medically speaking, a disease, but since it is usually compensated only as an accidental traumatic injury, it is an open question how it should be classified. It seems best to isolate it entirely in the list." (8)

of disability, and the injuries are classified into accidental injuries, occupational diseases, and hernias. Regardless of the degree of disability, the percentages for the three categories, accidental injuries, occupational diseases, and hernias, with respect to the total number of cases, total duration, and total compensation, are similar within each category. Thus, accidental injuries accounted for 84 percent of all cases, 81 percent of the total duration of all cases, and 80 percent of the total compensation paid for all cases; for occupational diseases the corresponding percentages are 11, 14, and 15, and for hernias, 5, 6, and 5. Infectious diseases accounted for approximately one-half of the occupational diseases, less than one-half of their total duration, and more than one-third of the compensation paid for them. A total of 69 (92 percent) of the 75 cases of infectious disease is associated with tuberculosis. Considering all 1,337 cases, the average compensation paid per case is $5,343. The highest averages are $9,432 and $9,287 paid for cases involving fatigue, strain, posture, *and* lighting, and temperature, moisture, *and* air pressure, respectively. About one-half of the 30 cases constituting the former classification were equally divided between cases associated with tuberculosis and eye affections, while approximately two-thirds of the 30 cases of the temperature, moisture, and air-pressure group were associated with tuberculosis. The average compensation paid per case of occupational disease is $6,964, which is 36 percent greater than the average for accidental injuries and 30 percent greater than the average for all 1,337 cases.

Details not given in table 1 but concerning the complicating agent associated with the groups entering the classification used are of sufficient importance to be included here. Only those complicating agents will be noticed that are associated with 10 or more percent of the cases of a particular category. Of the 825 cases representing diseases resulting from accidental injuries, 196 (24 percent) are accounted for by arthritis, 154 (19 percent) by general infections, 98 (12 percent) by bone infections, 97 (12 percent) by eye cases materially aggravated by infections, and 83 (10 percent) by neuroses. Of the 293 cases under diseases activated or aggravated by accidental injuries, 120 (41 percent) are accounted for by arthritis, 59 (20 percent) by venereal diseases, and 28 (10 percent) by tuberculosis. Of the 16 cases representing dusts, gases, and chemicals, 5 are associated with lead and 4 with tuberculosis.

Table 1 shows, moreover, that the partially disabled include 953 cases, or 71 percent of the total; those totally disabled include 384 cases, or 29 percent. The total duration of cases and the total compensation paid for all cases, respectively, are, however, similar in magnitude for both groups of disability. The average compensation paid per partially disabled case is generally less than the average paid

TABLE 1.—*Incomplete cases with disease as a complicating factor as of Dec. 31, 1935: Number of cases, duration, and compensation paid, classified according to kind of injury*

Kind of injury	Cases		Duration in days to Dec. 31, 1935		Compensation to Dec. 31, 1935			
	Number	Percent	Number	Percent	Amount	Percent	Average per case	Average per case divided by average for all cases
	Partial and total disability							
Total	1,337	100.0	2,685,584	100.0	$7,143,884	100.0	$5,343	1.0
Accidental injuries	1,118	83.7	2,171,044	80.8	5,706,851	79.9	5,105	1.0
Diseases resulting from accidental injuries	825	61.8	1,584,842	59.0	4,202,979	58.8	5,095	1.0
Diseases activated or aggravated by accidental injuries	293	21.9	586,202	21.8	1,503,872	21.1	5,133	1.0
Occupational diseases	151	11.2	367,355	13.7	1,051,505	14.7	6,964	1.3
Infectious diseases	75	5.6	141,669	5.3	394,227	5.5	5,256	1.0
Fatigue, strain, posture, lighting	30	2.2	96,546	3.6	282,957	4.0	9,432	1.8
Temperature, moisture, air pressure	30	2.2	96,997	3.6	278,608	3.9	9,287	1.7
Dusts, gases, chemicals	16	1.2	32,143	1.2	95,713	1.3	5,982	1.1
Hernias	68	5.1	147,185	5.5	385,528	5.4	5,670	1.1
	Partial disability							
Total	953	100.0	1,383,623	100.0	$3,822,558	100.0	$4,011	0.8
Accidental injuries	836	87.7	1,219,181	88.1	3,334,731	87.2	3,989	.7
Diseases resulting from accidental injuries	637	66.8	941,856	68.1	2,604,505	68.1	4,089	.8
Diseases activated or aggravated by accidental injuries	199	20.9	277,325	20.0	730,226	19.1	3,669	.7
Occupational diseases	71	7.5	109,246	7.9	325,869	8.6	4,590	.9
Infectious diseases	40	4.2	48,352	3.5	133,502	3.5	3,338	.6
Fatigue, strain, posture, lighting	12	1.3	31,712	2.3	94,782	2.5	7,898	1.5
Temperature, moisture, air pressure	9	.9	17,253	1.2	55,011	1.5	6,112	1.1
Dusts, gases, chemicals	10	1.1	11,929	.9	42,574	1.1	4,257	.8
Hernias	46	4.8	55,196	4.0	161,958	4.2	3,521	.7
	Total disability							
Total	384	100.0	1,301,961	100.0	$3,321,326	100.0	$8,649	1.6
Accidental injuries	282	73.4	951,863	73.1	2,372,120	71.4	8,412	1.6
Diseases resulting from accidental injuries	188	48.9	642,986	49.4	1,598,474	48.1	8,503	1.6
Diseases activated or aggravated by accidental injuries	94	24.5	308,877	23.7	773,646	23.3	8,230	1.5
Occupational diseases	80	20.9	258,109	19.8	725,636	21.9	9,070	1.7
Infectious diseases	35	9.1	93,317	7.2	260,725	7.9	7,449	1.4
Fatigue, strain, posture, lighting	18	4.7	64,834	5.0	188,175	5.7	10,454	2.0
Temperature, moisture, air pressure	21	5.5	79,744	6.1	223,597	6.7	10,647	2.0
Dusts, gases, chemicals	6	1.6	20,214	1.5	53,139	1.6	8,856	1.7
Hernias	22	5.7	91,989	7.1	223,570	6.7	10,162	1.9

for all 1,337 cases; the average compensation per totally disabled case, on the other hand, is between 1.5 and 2 times the average paid for all cases. While the occupational diseases accounted for approximately 8 percent of the number, total duration, and total cost, respectively, of the partially disabled cases, the corresponding percentage for the totally disabled cases is more than twice as great, namely about 20 percent; for the accidental injuries, the corresponding difference is of a smaller order of magnitude but in the opposite direction. For the partially and totally disabled groups, respectively, the average compensation paid per case of occupational disease is 15 and 8 percent greater than the corresponding average paid for accidental injuries.

Quinquennium in which injury occurred.—Table 2 shows the three categories, accidental injuries, occupational diseases, and hernias, of

TABLE 2.—*Incomplete cases with disease as a complicating factor as of Dec. 31, 1935: Accidental injuries, occupational diseases, and hernias, classified according to quinquennium of occurrence*

Kind of injury and quinquennium in which it occurred	Partial and total disability		Partial disability		Total disability	
	Number	Percent	Number	Percent	Number	Percent
	Total					
Total	1,337	100.0	953	100.0	384	100.0
Before 1916	4	.3	0	0	4	1.0
1916-20	293	21.9	188	19.7	105	27.4
1921-25	337	25.3	219	23.1	118	30.8
1926-30	423	31.6	310	32.5	113	29.4
1931-35	280	20.9	236	24.7	44	11.4
	Accidental injuries					
Total	1,118	100.0	836	100.0	282	100.0
Before 1916	3	.3	0	0	3	1.1
1916-20	247	22.0	170	20.3	77	27.3
1921-25	288	25.8	196	23.5	92	32.6
1926-30	356	31.8	277	33.1	79	28.0
1931-35	224	20.1	193	23.1	31	11.0
	Occupational diseases					
Total	151	100.0	71	100.0	80	100.0
Before 1916	1	0.7	0	0	1	1.2
1916-20	22	14.5	7	9.8	15	18.7
1921-25	32	21.2	10	14.1	22	27.5
1926-30	48	31.8	18	25.3	30	37.6
1931-35	48	31.8	36	50.8	12	15.0
	Hernias					
Total	68	100.0	46	100.0	22	100.0
Before 1916	0	0	0	0	0	0
1916-20	24	35.3	11	23.9	13	59.0
1921-25	17	25.0	13	28.2	4	18.2
1926-30	19	28.0	15	32.7	4	18.2
1931-35	8	11.7	7	15.2	1	4.6

different degrees of severity, classified according to the quinquennium in which the disability occurred. Regardless of the severity of disability, the percentage distribution of cases among the four 5-year periods in each of the three categories is obviously different. About one-half of the accidental injuries, 63 percent of the occupational diseases, and 40 percent of the hernias, respectively, were being compensated on December 31, 1935, for injuries that occurred less than 10 years ago. With respect to partial disability, the corresponding percentages for the three categories are 56, 76, and 48, while the cor-

TABLE 3.—*Incomplete cases with disease as a complicating factor as of Dec. 31, 1935: Accidental injuries and occupational diseases classified according to nature of injury*

Nature of injury	Partial and total disability		Partial disability		Total disability	
	Number	Percent	Number	Percent	Number	Percent
	Total, inclusive of hernias					
Total	1,337	100.0	[1] 953	100.0	[2] 384	100.0
Fracture	507	37.9	398	41.7	109	28.4
Sprain, strain	207	15.5	155	16.2	52	13.5
Bruise, contusion, abrasion, blister	162	12.1	113	11.9	49	12.8
Cut, laceration	74	5.5	70	7.3	4	1.0
Puncture	56	4.2	42	4.4	14	3.6
Burn, scald	28	2.1	17	1.8	11	2.9
Concussion	28	2.1	12	1.3	16	4.2
Amputation	17	1.3	16	1.7	1	.3
Dislocation	14	1.0	13	1.4	1	.3
Miscellaneous	[3] 244	18.3	117	12.3	127	33.0
	Accidental injuries					
Total	1,118	100.0	836	100.0	282	100.0
Fracture	503	45.0	394	47.1	109	38.6
Sprain, strain	135	12.1	108	12.9	27	9.6
Bruise, contusion, abrasion, blister	161	14.4	113	13.5	48	17.0
Cut, laceration	74	6.6	70	8.4	4	1.4
Puncture	55	4.9	42	5.0	13	4.6
Burn, scald	25	2.2	16	1.9	9	3.2
Concussion	28	2.5	12	1.5	16	5.7
Amputation	17	1.5	16	1.9	1	.4
Dislocation	14	1.3	13	1.6	1	.4
Miscellaneous	[4] 106	9.5	52	6.2	54	19.1
	Occupational diseases					
Total	151	100.0	71	100.0	80	100.0
Fracture	1	.7	1	1.4	0	0
Sprain, strain	12	7.9	6	8.5	6	7.5
Bruise, contusion, abrasion, blister	1	.7	0	0	1	1.2
Cut, laceration	0	0	0	0	0	0
Puncture	1	.6	0	0	1	1.3
Burn, scald	3	2.0	1	1.4	2	2.5
Concussion	0	0	0	0	0	0
Amputation	0	0	0	0	0	0
Dislocation	0	0	0	0	0	0
Miscellaneous	[5] 133	88.1	63	88.7	70	87.5

[1] Includes 46 cases of hernia.
[2] Includes 22 cases of hernia.
[3] Includes 100 cases associated with tuberculosis, 23 with the eye, and 22 with general infections.
[4] Includes 22 cases associated with general infections and 20 cases associated with the eye.
[5] Includes 99 cases associated with tuberculosis.

responding figures for total disability are 39, 53, and 23. The category of occupational diseases is the only one having the majority of its cases, with respect to either partial or total disability, occurring less than 10 years ago.

Nature of injury.—The distribution of the incomplete cases constituting accidental injuries and occupational diseases, according to the nature of the injury, is given in table 3. The category "hernias" has been omitted for obvious reasons. Fractures, bruises, and sprains account for 45, 14, and 12 percent, respectively, of the accidental injuries, the same order with approximately the same order of magnitude holding for the partially disabled as well as the totally disabled cases.

Of the occupational diseases, 133 cases (88 percent) are included in a miscellaneous group, the majority, 74 percent, being associated with tuberculosis.

Anatomical location of injury.—In table 4 the incomplete cases are classified according to the anatomical location of the injury. Hernias have been again omitted for obvious reasons. The percentage distributions concerned with the severity of disability resulting from accidental injuries are remarkably different. Considering those regions that are associated with 10 or more percent of the cases, the partial-disability cases lead with the lower extremities and are followed in order of magnitude by the trunk, upper extremities, head, and hand, while the total-disability cases lead with the head and are followed by the trunk and lower extremities. Thirty-eight percent of the partial-disability cases are associated with the lower extremities, while 35 percent of the total disability cases are associated with the head. The occupational diseases, on the other hand, are primarily associated with the trunk in each disability group.

Duration of cases, compensation paid, and estimated future cost by quinquennium of occurrence of injury.—Table 5 shows for the three categories—accidental injuries, occupational diseases, and hernias—the duration of the cases, the compensation paid, and the estimated future cost, classified according to the quinquennium in which the injury occurred. Data on hernias are included for the sake of completeness.

The percentage distributions of the cases were referred to previously under table 2. Regardless of the degree of severity, it will be observed (table 5) that in connection with accidental injuries approximately one-third of the total duration and total compensation paid, respectively, are accounted for by injuries that occurred less than 10 years ago; for occupational diseases the corresponding fraction is nearer one-half. With respect to the estimated future cost, injuries that occurred less than 10 years ago account for approximately one-half of the total associated with accidental injuries, and nearly 60 percent

of the total associated with occupational diseases. Thus, in all three instances, duration, compensation paid, and future cost, the percentages for the occupational diseases are sensibly greater than the corresponding ones for the accidental injuries.

With regard to partial disability connected with accidental injuries, approximately 40 percent of the total duration and total compensation paid, respectively, are accounted for by injuries that occurred less than 10 years ago. The corresponding percentage for occupational diseases is 55. With respect to the estimated future cost, injuries that occurred less than 10 years ago account for 55 percent of the total associated with accidental injuries, and for 62 percent of the total estimated for the occupational diseases. The corresponding picture presented by the cases involving total disability is clearly

TABLE 4.—*Incomplete cases with disease as a complicating factor as of December 31, 1935: Accidental injuries and occupational diseases classified according to anatomical region affected*

Anatomical region affected	Partial and total disability		Partial disability		Total disability	
	Number	Percent	Number	Percent	Number	Percent
	Total, inclusive of hernias					
Total	1,337	100.0	[1] 953	100.0	[2] 384	100.0
Trunk	399	29.9	249	26.1	150	39.1
Lower extremities	377	28.2	319	33.5	58	15.1
Head	238	17.8	128	13.4	110	28.6
Upper extremities	153	11.4	135	14.2	18	4.7
Hand	111	8.3	103	10.8	8	2.1
Multiple regions	37	2.8	10	1.1	27	7.0
Face and neck	4	.3	2	.2	2	.5
Miscellaneous	18	1.3	7	.7	11	2.9
	Accidental injuries					
Total	1,118	100.0	836	100.0	282	100.0
Trunk	229	20.5	151	18.1	78	27.7
Lower extremities	371	33.2	316	37.8	55	19.5
Head	223	19.9	124	14.8	99	35.1
Upper extremities	151	13.5	135	16.2	16	5.7
Hand	104	9.3	98	11.7	6	2.1
Multiple regions	32	2.8	9	1.1	23	8.1
Face and neck	4	.4	2	.2	2	.7
Miscellaneous	4	.4	1	.1	3	1.1
	Occupational diseases					
Total	151	100.0	71	100.0	80	100.0
Trunk	105	69.6	53	74.7	52	65.0
Lower extremities	6	4.0	3	4.2	3	3.7
Head	15	9.9	4	5.6	11	13.8
Upper extremities	2	1.3	0	0	2	2.5
Hand	7	4.6	5	7.0	2	2.5
Multiple regions	3	2.0	1	1.4	2	2.5
Face and neck	0	0	0	0	0	0
Miscellaneous	13	8.6	5	7.1	8	10.0

[1] Includes 46 cases of hernia.
[2] Includes 22 cases of hernia.

different. While the percentages with respect to duration, compensation, and future cost, respectively, are larger for the occupational diseases than the corresponding ones for the accidental injuries, whether or not the cases are specific for degree of disability, the percentages for total disability are lower, and considerably lower in most instances, than the corresponding percentages for partial disability in the same category of injury.

Cases of different quinquennia: Number, duration, compensation paid, and estimated future cost, by kind of injury.—The previous table presented data specific for degree of severity on the duration, compensation paid, and estimated future cost, for the cases of each of the three categories, accidental injuries, occupational diseases, and hernias, classified according to the quinquennium in which the injury occurred. This arrangement of the material made it possible to show within each category, specific for degree of severity, the distribution of the cases with respect to duration, compensation paid, and estimated future cost, respectively, according to the quinquennium of occurrence of the injury, and to make intercategory comparisons of these distributions as well as comparisons of them within a particular category.

A number of pertinent questions now logically arise. They may be briefly stated as follows: Of the incomplete cases with disease as a complicating factor that arose in a particular quinquennium, what proportion was accounted for by accidental injuries, occupational diseases, and hernias, respectively? What proportion of the total duration, compensation paid, and estimated future cost, respectively, associated with cases arising in a particular quinquennium was accounted for by accidental injuries, occupational diseases, and hernias, respectively? In other words, what are the time changes in the percentage distribution of accidental injuries, occupational diseases, and hernias, with respect to number of cases, duration, compensation paid, and estimated future cost, respectively?

To facilitate the investigation of the questions raised, the data have been reclassified as shown in table 6, with the cases involving partial and total disability, respectively, combined within each category. It will be observed that the percentage of cases in each of the four quinquennia associated with accidental injuries is approximately constant, varying from 80 to 85 percent. Thus, of all of the incomplete cases with disease as a complicating factor that originated in a particular quinquennium, approximately the same proportion in each quinquennium involved accidental injuries. Occupational diseases, on the other hand, show increasing percentages from 8 percent in 1916–20 to 17 percent in 1931–35, the percentage for 1931–35 being about 50 percent greater than the corresponding one for 1926–30. The percentages for hernias gradually decrease from 8 to 3 percent.

TABLE 5.—*Incomplete cases with disease as a complicating factor as of Dec. 31, 1935: Accidental injuries, occupational diseases, and hernias; duration of cases, compensation paid, and estimated future cost, classified according to quinquennium of occurrence of the injury*

Quinquennium in which injury occurred	Partial and total disability							Partial disability							Total disability						
	Number of cases	Duration in days to Dec. 31, 1935		Compensation to Dec. 31, 1935		Estimated future cost		Number of cases	Duration in days to Dec. 31, 1935		Compensation to Dec. 31, 1935		Estimated future cost		Number of cases	Duration in days to Dec. 31, 1935		Compensation to Dec. 31, 1935		Estimated future cost	
		Number	Percent	Amount	Percent	Amount	Percent		Number	Percent	Amount	Percent	Amount	Percent		Number	Percent	Amount	Percent	Amount	Percent
											TOTAL										
Total	1,337	2,685,584	100.0	$7,143,884	100.0	$8,221,841	100.0	953	1,383,623	100.0	$3,822,558	100.0	$3,030,865	100.0	384	1,301,961	100.0	$3,321,326	100.0	$5,190,976	100.0
Before 1916	4	9,604	.4	19,748	.3	37,209	.4	0	0	0	0	0	0	0	4	9,604	.7	19,748	.6	37,209	.7
1916–20	293	938,058	34.8	2,374,780	33.2	1,724,595	21.0	188	429,152	30.9	1,125,776	29.4	602,778	19.9	105	508,906	39.1	1,249,004	37.6	1,121,817	21.6
1921–25	337	858,981	32.0	2,253,653	31.5	2,164,614	26.3	219	403,994	29.2	1,137,828	29.7	757,335	25.0	118	454,987	35.0	1,116,325	33.6	1,407,279	27.1
1926–30	423	662,512	24.7	1,914,065	26.8	2,752,840	33.5	310	391,802	28.4	1,139,024	29.8	936,220	30.8	113	270,710	20.8	775,041	23.4	1,816,620	35.0
1931–35	280	216,429	8.1	581,638	8.2	1,542,583	18.8	236	158,675	11.5	420,430	11.1	734,532	24.3	44	57,754	4.4	161,208	4.8	808,051	15.6
											ACCIDENTAL INJURIES										
Total	1,118	2,171,044	100.0	$5,706,851	100.0	$6,191,787	100.0	836	1,219,181	100.0	$3,334,731	100.0	$2,596,837	100.0	282	951,863	100.0	$2,372,120	100.0	$3,594,950	100.0
Before 1916	3	7,702	.4	14,469	.3	29,621	.5	0	0	0	0	0	0	0	3	7,702	.8	14,469	.6	29,621	.8
1916–20	247	755,866	34.9	1,882,717	32.9	1,295,852	20.8	170	388,299	31.9	998,944	30.0	516,404	19.9	77	367,567	38.6	883,773	37.3	779,448	21.6
1921–25	288	711,035	32.8	1,863,764	32.7	1,684,624	27.2	196	359,128	29.4	1,011,306	30.4	663,350	25.5	92	351,907	37.0	852,458	35.9	1,021,274	28.4
1926–30	356	530,925	24.4	1,509,505	26.4	2,020,767	32.7	277	345,370	28.4	994,088	29.7	814,010	31.3	79	185,555	19.5	515,417	21.7	1,206,727	33.6
1931–35	224	165,516	7.5	436,396	7.7	1,160,923	18.8	193	126,384	10.3	330,393	9.9	603,043	23.3	31	39,132	4.1	106,003	4.5	557,880	15.6
											OCCUPATIONAL DISEASES										
Total	151	367,355	100.0	$1,051,505	100.0	$1,726,718	100.0	71	109,246	100.0	$325,869	100.0	$321,127	100.0	80	258,109	100.0	$725,636	100.0	$1,405,591	100.0
Before 1916	1	1,902	.5	5,279	.5	7,588	.4	0	0	0	0	0	0	0	1	1,902	.7	5,279	.7	7,588	.5
1916–20	22	98,825	26.9	275,712	26.2	270,279	15.7	7	21,020	19.2	69,924	21.5	50,182	15.7	15	77,805	30.1	205,788	28.4	220,097	15.7
1921–25	32	113,550	31.0	308,696	29.4	442,644	25.7	10	27,772	25.4	77,524	23.8	71,120	22.1	22	85,778	33.3	231,172	31.9	371,524	26.4
1926–30	48	107,024	29.1	329,840	31.3	640,932	37.0	18	31,405	28.8	98,367	30.2	80,959	25.2	30	75,619	29.3	231,473	31.8	559,973	39.9
1931–35	48	46,054	12.5	131,978	12.6	365,275	21.2	36	29,049	26.6	80,054	24.5	118,866	37.0	12	17,005	6.6	51,924	7.2	246,409	17.5

HERNIAS

Total	68	147, 185	100.0	$385, 528	100.0	$303, 336	100.0	46	55, 196	100.0	$161, 958	100.0	$112, 901	100.0	22	91, 989	100.0	$223, 570	100.0	$190, 435	100.0
Before 1916	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1916–20	24	83, 367	56.7	216, 351	56.1	158, 464	52.2	11	19, 833	35.9	56, 908	35.1	36, 192	32.0	13	63, 534	69.1	159, 443	71.3	122, 272	64.2
1921–25	17	34, 396	23.3	81, 193	21.2	37, 346	12.4	13	17, 094	31.0	48, 498	29.9	22, 865	20.4	4	17, 302	18.7	32, 695	14.6	14, 481	7.6
1926–30	19	24, 563	16.7	74, 720	19.3	91, 141	30.0	15	15, 027	27.2	46, 569	28.8	41, 221	36.4	4	9, 536	10.4	28, 151	12.6	49, 920	26.2
1931–35	8	4, 859	3.3	13, 264	3.4	16, 355	5.4	7	3, 242	5.9	9, 983	6.2	12, 623	11.2	1	1, 617	1.8	3, 281	1.5	3, 762	2.0

TABLE 6.—*Incomplete cases with disease as a complicating factor as of Dec. 31, 1935: Cases of different quinquennia; number of cases, duration, compensation paid, and estimated future cost, classified according to kind of injury*

Kind of injury	Cases		Duration in days to Dec. 31, 1935		Compensation to Dec. 31, 1935		Estimated future cost	
	Number	Percent	Number	Percent	Amount	Percent	Amount	Percent
	Total, 1916-35							
Total	[1] 1,333	100.00	2,675,980	100.00	$7,124,136	100.00	$8,184,632	100.00
Accidental injuries	1,115	83.65	2,163,342	80.84	5,692,382	79.90	6,162,166	75.29
Occupational diseases	150	11.25	365,453	13.66	1,046,226	14.69	1,719,130	21.00
Hernias	68	5.10	147,185	5.50	385,528	5.41	303,336	3.71
	1916-20							
Total	293	100.00	938,058	100.00	$2,374,780	100.00	$1,724,595	100.00
Accidental injuries	247	84.30	755,866	80.58	1,882,717	79.28	1,295,852	75.14
Occupational diseases	22	7.51	98,825	10.53	275,712	11.61	270,279	15.67
Hernias	24	8.19	83,367	8.89	216,351	9.11	158,464	9.19
	1921-25							
Total	337	100.00	858,981	100.00	$2,253,653	100.00	$2,164,614	100.00
Accidental injuries	288	85.46	711,035	82.78	1,863,764	82.70	1,684,624	77.83
Occupational diseases	32	9.50	113,550	13.22	308,696	13.70	442,644	20.45
Hernias	17	5.04	34,396	4.00	81,193	3.60	37,346	1.72
	1926-30							
Total	423	100.00	662,512	100.00	$1,914,065	100.00	$2,752,840	100.00
Accidental injuries	356	84.16	530,925	80.14	1,509,505	78.87	2,020,767	73.41
Occupational diseases	48	11.35	107,024	16.15	329,840	17.23	640,932	23.28
Hernias	19	4.49	24,563	3.71	74,720	3.90	91,141	3.31
	1931-35							
Total	280	100.00	216,429	100.00	$581,638	100.00	$1,542,583	100.00
Accidental injuries	224	80.00	165,516	76.48	436,396	75.03	1,160,923	75.26
Occupational diseases	48	17.14	46,054	21.28	131,978	22.69	365,275	23.68
Hernias	8	2.86	4,859	2.24	13,264	2.28	16,385	1.06

[1] Excludes 4 cases involving injuries which occurred prior to 1916.

With respect to duration, approximately 80 percent of the total duration of all cases specific for quinquennium of origin are accounted for by accidental injuries. The percentages for occupational diseases gradually increase from 11 to 21 percent, and for hernias there is a gradual decrease from 9 to 2 percent.

Accidental injuries claimed from 75 to 83 percent of the total compensation paid for all injuries occurring in specific quinquennia. For occupational diseases the corresponding percentages increase from 12 percent for 1916–20 to a percentage for 1931–35 almost again as large,

namely, 23 percent. Hernias show percentages declining from 9 to 2 percent.

The percentage of the estimated future cost of all injuries occurring in particular quinquennia is approximately constant for accidental injuries, varying in magnitude from 73 to 78 percent. The corresponding percentages for occupational diseases increase from 16 to 24 percent, while hernias fluctuate from 9 to 1 percent.

The data upon which the foregoing remarks are based are shown graphically in figure 1. All of the data involve cases that are incom-

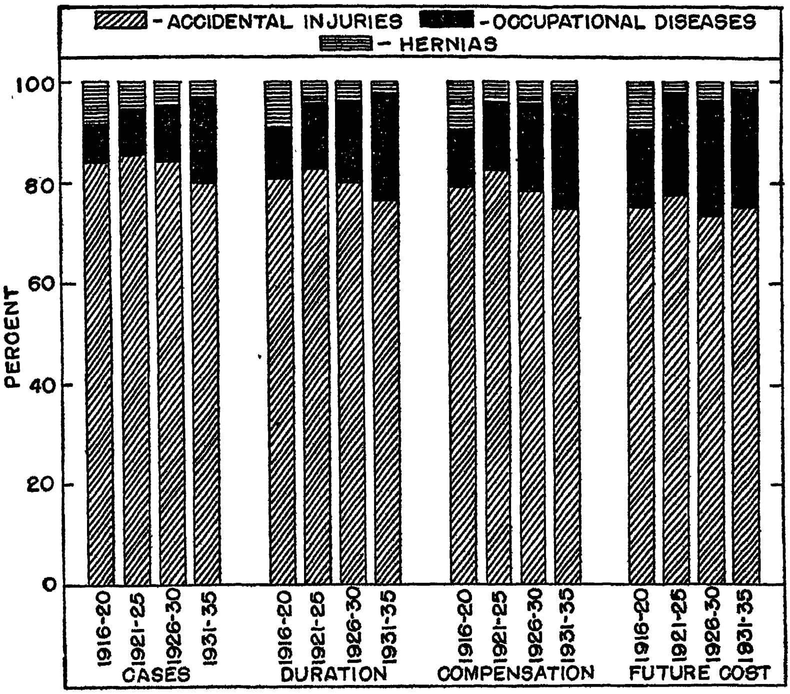

FIGURE 1.—Percentage distribution of the number of cases, duration, compensation paid, and estimated future cost, respectively, according to kind of injury by quinquennium of occurrence of injury. Percentage distributions of the number of cases, duration, compensation paid, and estimated future cost, respectively, grouped for all quinquennia. N. B. *All cases are incomplete as of December 31, 1935, and involve disease as a complicating factor.*

plete as of December 31, 1935, and disease is present in each case as a complicating factor.

To show the relation existing among cases, duration, compensation paid, and estimated future cost, for each quinquennium, the bars of figure 1 have been reordered with results as shown in figure 2. Of importance is the fact that for each quinquennium the category embracing the occupational diseases is the only one with percentages that gradually increase when the percentage distributions of cases, duration, compensation paid, and estimated future cost are succes-

sively observed. Indeed, with the exception of 1931–35, each of the quinquennia shows percentages for estimated future cost that are at least twice as large as the percentages for number of cases; the quinquennium 1931–35 shows an increase of approximately 40 percent. Thus, for the quinquennium 1916–20, the percentages increase from

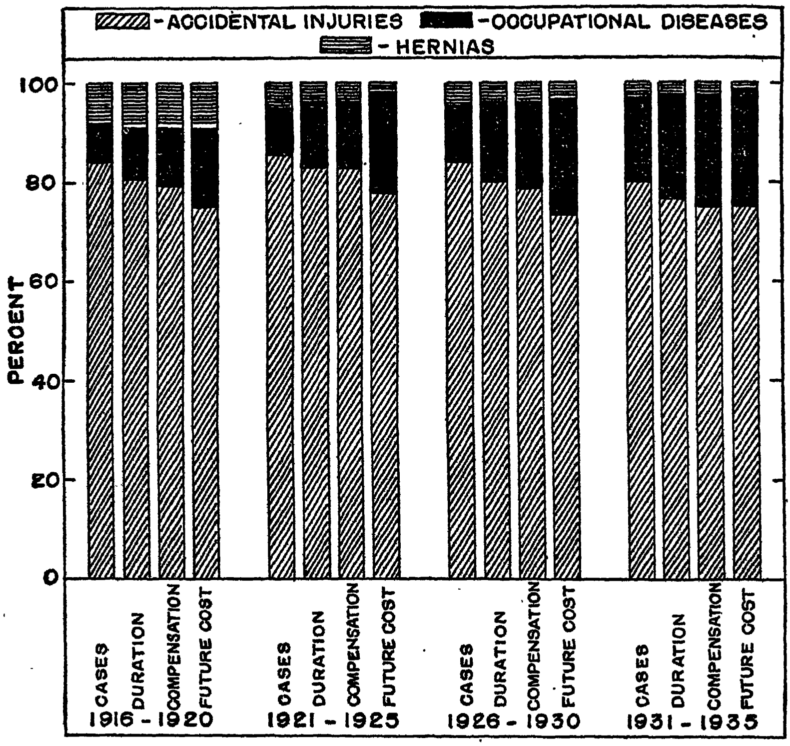

FIGURE 2.—Percentage distribution of the number of cases, duration, compensation paid, and estimated future cost, respectively, according to kind of injury by quinquennium of occurrence of injury. Percentage distributions of the number of cases, duration, compensation paid, and estimated future cost, grouped by quinquennium of occurrence of injury. N. B. *All cases are incomplete as of December 31, 1935, and involve disease as a complicating factor.*

8 to 16 percent; for 1921–25, from 10 to 20 percent; for 1926–30, from 11 to 23 percent; and for 1931–35, from 17 to 24 percent.

SUMMARY

This paper deals with the duration and cost of 1,337 incomplete cases in which disease is a complicating factor, the cases being classified into accidental injuries, occupational diseases, and hernias. The cases occurred among civil employees of the United States Government, and are incomplete in the sense that they were still being compensated on December 31, 1935. The disability involved is long-continued or permanent, both partial and total.

The Federal act providing for this compensation was approved in 1916 and has been administered by the United States Employees' Compensation Commission. The estimated number of employees within the scope of the act for a period approximately 15 years prior to 1933 did not exceed 700,000. Since 1933 the number has increased to between 900,000 and 1,000,000.

The various percentages given below, and associated, for example, with occupational diseases, are based on incomplete cases with disease as a complicating factor; had the study also included cases with no disease, the percentages, obviously, would have been lower than those given.

A recent report (*1*) based on the present collection of cases offers material of an introductory as well as of a supplementary nature.

The results of the analyses may be summarized as follows:

(1) Accidental injuries accounted for 84 percent of the cases, 81 percent of the total duration of all cases, 80 percent of the total compensation paid, and 75 percent of the estimated future cost; for the occupational diseases the corresponding percentages are 11, 14. 15, and 21, and for hernias, 5, 6, 5, and 4.

(2) Infectious diseases, principally tuberculosis, accounted for approximately one-half the occupational diseases, less than one-half of their total duration, and more than one-third of the compensation paid for them.

(3) The average compensation paid per case of occupational disease was $6,964, which is 36 percent greater than the average paid for accidental injuries and 30 percent greater than the average, $5,343, for all 1,337 cases.

(4) Of the total number of cases, 71 percent were partially disabled; the remainder were totally disabled. While the occupational diseases accounted for approximately 8 percent of the number, total duration, and total cost, respectively, of the partially disabled cases, the corresponding percentage for the totally disabled cases was more than twice as great; for the accidental injuries, the corresponding difference was of a smaller order of magnitude but in the opposite direction.

(5) About one-half of the accidental injuries, 63 percent of the occupational diseases, and 40 percent of the hernias, respectively, were being compensated on December 31, 1935, for injuries that occurred less than 10 years ago.

(6) Fractures, bruises, and sprains accounted for 45, 14, and 12 percent, respectively, of the accidental injuries.

(7) Of the accidental injuries resulting in partial disability, 38 percent were associated with the lower extremities; of those resulting in total disability, 35 percent were associated with the head. The occupational diseases were primarily associated with the trunk in each disability group.

(8) The percentage of cases originating in each of the 4 quinquennia between 1916 and 1935 due to accidental injuries varied between 80 and 85 percent; for occupational diseases the percentages increased from 8 percent in 1916–20 to 17 percent in 1931–35.

ACKNOWLEDGMENTS

The author is indebted to Chairman Jewell W. Swofford, of the United States Employees' Compensation Commission, for making possible the preparation of this paper, to Dr. F. M. Phillips for providing the basic data, and to Secretary William McCauley for helpful interpretations.

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STUDIES IN CHEMOTHERAPY

II. CHEMOTHERAPY OF EXPERIMENTAL PNEUMOCOCCUS INFECTIONS

By SANFORD M. ROSENTHAL, *Senior Pharmacologist, National Institute of Health, United States Public Health Service*

In 1934 it was found (*1*) that formaldehyde sulphoxylate was capable of curing mice infected with a strain of type I pneumococcus (NIH strain). Although highly effective on this strain, negative results were obtained with all other cultures tested. Many strains (types I to XXXII) were studied with negative results.

An analysis of the action of sulphoxylate *on the susceptible strain* (NIH type I) has shown the following:

(1) The action is highly specific. A large number of other compounds, either chemically related or possessing a reducing action, were found devoid of chemotherapeutic effect. Dr. Raymond M. Hann, of this Institute, prepared some related sulphoxylates and sulphinates. The only compound that possessed activity was amino methyl sulphoxylic acid. This is evidence that the chemotherapeutic effect is related to the sulphoxylate portion of the molecule and is not dependent upon the formaldehyde.

(2) Oxidation of sulphoxylate with H_2O_2, at low temperature, destroys its curative action.

(3) The organisms grow abundantly in 0.5 to 1.0 percent solutions of sulphoxylate in broth, but under such conditions the culture becomes avirulent within a few days.

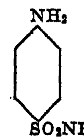
(4) Peritoneal smears of mice inoculated intraperitoneally with the NIH strain show a marked increase in phagocytosis of pneumococci in these animals treated with sulphoxylate.

(5) Animals cured of infection with the Institute strain were found to be immune to many lethal doses of type I pneumococci even when strains were employed which were not of themselves affected by sulphoxylate therapy.

THE EFFECT OF SULPHONAMIDE COMPOUNDS

In 1935 it was announced by Domagk (*2*) (*3*) that in certain azo dyes, the presence of a sulphonamide group decreased the antiseptic action but caused them to protect or cure mice infected with fatal doses of hemolytic streptococci. The most effective of these were 4-sulphonamide-2-4 diaminobenzol (Prontosil) and 4-sulphonamide-phenyl-2-azo-7-acetylamino-1-hydroxy-naphthalene-3, 6-sodium disulphonate (Prontosil soluble).

Trefouel, Nitti, and Bovet (*4*) found that the azo linkage was not essential for the chemotherapeutic activity and that p-aminobenzene sulphonamide was equally effective.



p-aminobenzene sulphonamide

These observations have been confirmed and extended by Goissedet (*5*), Levaditi (*6, 7, 8, 9*), and Fourneau (*10*) in France, and by Buttle, Grey, and Stephenson (*11*) and Colebrook and Kenny (*12*) in England. Most of their experiments were carried out with oral administration of the drugs, as Domagk originally found this method gave better results. However, Levaditi demonstrated that a single subcutaneous injection of Prontosil in oil (50 mg per mouse) would protect mice for 25 days against lethal doses of streptococci. Nitti and Bovet (*13*) have shown that streptococci of low virulence are affected little or not at all by Prontosil. We have carried out preliminary experiments which confirm the above results.

While Domagk originally claimed some effect of Prontosil against type III pneumococcus, subsequent investigators have found no appreciable action upon experimental pneumococcus infections (*11*) (*13*). In their experiments the drugs were usually administered by mouth.

We have conducted experiments with mice on the effect of some sulphonamide and related compounds on pneumococci infections.

Prontosil [1] in oil and aqueous solutions of Prontosil soluble [1] have yielded slight or negative results. Sulphonamide [2] (p-aminobenzene sulphonamide) has shown consistent chemotherapeutic activity on seven strains of pneumococci (types I, II, and III). In all cases there has been a marked prolongation of life, from 3 to 12 days (the control animals usually die from 18 to 36 hours after infection). With the strains most favorably affected, a considerable percentage of the animals permanently survived.

METHOD

Eighteen-hour broth cultures of pneumococci were used. As far as possible, the infective dose was adjusted so that 10 to 100 lethal doses were injected. Dilutions of the organisms were made in broth, and 0.5 cc of the diluted culture was injected intraperitoneally. Treatment was begun within an hour after inoculation and was administered subcutaneously in all cases. The p-aminobenzene sulphonamide and Prontosil were finely powdered with a mortar and pestle, and triturated with olive oil to make a 20- to 30-percent emulsion.

We have obtained the most favorable results with sulphonamide by two daily injections of the drug. Treatment must be continued for 5 to 8 days.

RESULTS

With the Institute strain (NIH type I) susceptible to sulphoxylate therapy equally striking results were obtained with sulphonamide (table 1). From 86 to 100 percent cures were effected. This was true with a culture that had not been passed through mice for several months and was of low virulence, as well as with a culture whose virulence had been raised to 10^{-6} by mouse passage. No effect was observed from Prontosil soluble therapy.

TABLE 1.—*Effect of subcutaneous therapy upon type I pneumococcus (NIH strain) infection produced by intraperitoneal inoculation. Tests were conducted upon cultures of both low and high virulence*

Pneumococcus strain	Dilution	Number of mice	Therapy, subcutaneous	Deaths in days 1	2	3	4	5	6	7	Percent survived
NIH, type I	10^{-2}	5	None	4	1						0
		30	*Sulphoxylate*, 1.8 g per kilo 1st day, 1.4 g 2d day, 1 g 3d day.			1					97
NIH, type I	10^{-4}	9	None	8	1						0
		7	*Sulphonamide*, 1 g per kilo daily for 3 days.				1				86
NIH, type I	10^{-3}	7	None	6	1						0
		5	*Prontosil soluble*, 0.7 g per kilo	5							0
NIH, type I	10^{-6}	12	None	2	9						12
		12	*Sulphonamide*, 1 g per kilo B. D. for 2 days, once on 3d day.								100
		6	*Sulphoxylate*, 1 g per kilo B. D. for 2 days.								100

B. D. in the tables = twice daily.

[1] Obtained through the courtesy of the Winthrop Chemical Co.
[2] Prepared by Dr. James M. Johnson, of this Institute.

Tests were run upon highly virulent strains of pneumococcus types I, II, and III obtained from Lederle Laboratories. Control animals died within 18 to 48 hours. In animals treated with sulphonamide none died until the 3d to 5th day, and at the end of a week 25 to 42 percent were alive. With type III these surviving animals remained permanently well, while with types I and II most of them died within 10 days after inoculation (table 2). Two of six animals treated with Prontosil survived type III inoculation, otherwise there was no appreciable influence from Prontosil or Prontosil soluble.

TABLE 2.—*Effect of sulphonamide, Prontosil, and Prontosil soluble on types I, II, and III pneumococcus infections (Lederle strains)*

Pneumococcus strain	Dilution	Number of mice	Therapy, subcutaneous	Deaths in days							Percent survived
				1	2	3	4	5	6	7	
Lederle, type I	10^{-7}	12	None	8	4	---	---	---	---	---	0
		12	*Sulphonamide*, 0.8 g per kilo B. D. for 2 days, 0.5 B. D. 2 days, 0.7 g daily for 2 days.	---	---	---	2	3	---	3	[1] 25
		6	*Prontosil*, 1.3 g per kilo B. D.	2	4	---	---	---	---	---	0
		6	*Prontosil soluble*, 0.8 g per kilo B. D.	1	5	---	---	---	---	---	0
Lederle, type II	10^{-6}	12	None	12	---	---	---	---	---	---	0
		12	*Sulphonamide*, 0.8 g per kilo B. D. 1st day, 0.7 g B. D. 2d day, 0.5 g B. D. 3d day, 0.7 g daily 4th and 5th days.	---	---	3	4	---	1	1	[2] 25
		6	*Prontosil*, 1.6 g per kilo B. D.	6	---	---	---	---	---	---	0
		6	*Prontosil soluble*, 1 g per kilo B. D.	3	3	---	---	---	---	---	0
	10^{-7}	3	None	3	---	---	---	---	---	---	0
	10^{-8}	2	None	1	---	---	---	---	---	---	50
Lederle, type III	10^{-6}	12	None	2	8	---	---	---	1	---	8
		12	*Sulphonamide*, 1 g per kilo B. D. 1st day, 0.7 g B. D. 2d day, 0.5 g B. D. 3d and 4th days, 0.7 g daily 5th and 6th days.	---	---	---	2	3	2	---	42
		6	*Prontosil*, 1.6 g B. D. 2 days, 0.8 B. D. 2 days.	1	3	---	---	---	---	---	33
		6	*Prontosil soluble*, 1 g per kilo B. D.	---	6	---	---	---	---	---	0
	10^{-7}	2	None	---	2	---	---	---	---	---	0
	10^{-8}	2	None	---	---	---	---	---	---	---	100

[1] Two died on 8th day.
[2] One died on 8th day.

Similar experiments were carried out with type I, II, and III cultures obtained from the Mulford Laboratories. Essentially the same results were obtained (table 3). Prolongation of life from 4 to 8 days occurred in all animals receiving sulphonamide, with a small percentage of each group surviving permanently. With Prontosil soluble no appreciable effect was observed; with Prontosil 1 animal of 6 survived the inoculation with type II pneumococcus, while little or no prolongation of life was observed among the remaining animals.

The animals in which prolongation of life is brought about as a result of sulphonamide therapy show at autopsy much more marked localization of the infection. With the controls the bacteremia is intense, while in the treated animals fewer organisms are present in the blood, but there is usually present peritonitis with a purulent exudate.

TABLE 3.—*Effect of sulphonamide, Prontosil, and Prontosil S on types I, II, and III pneumococcus infections (Mulford strains)*

Pneumococcus strain	Dilution	Number of mice	Therapy, subcutaneous	Deaths in days 1	2	3	4	5	6	7	Percent survived
Mulford, type I	10^{-5}	12	None	12	---	---	---	---	---	---	0
		12	*Sulphonamide*, 1 g per kilo B. D. for 2 days, 0.6 g B. D. for 2 days.	---	---	---	6	3	1	1	8
		6	*Prontosil*, 1.6 g per kilo, B. D.	6	---	---	---	---	---	---	0
		6	*Prontosil soluble*, 1 g per kilo B. D.	4	2	---	---	---	---	---	0
	10^{-6}	2	None	1	1	---	---	---	---	---	0
	10^{-7}	2	None	1	1	---	---	---	---	---	------
Mulford, type II	10^{-6}	12	None	11	1	---	---	---	---	---	0
		12	*Sulphonamide*, 1 g per kilo B. D. for 2 days, 0.5 g per kilo B. D. for 2 days.	---	---	---	6	1	2	---	[1] 25
		6	*Prontosil*, 1.6 g per kilo B. D. for 2 days.	2	3	---	---	---	---	---	16
		6	*Prontosil soluble*, 1 g per kilo B. D.	4	2	---	---	---	---	---	0
Mulford, type III	10^{-6}	12	None	12	---	---	---	---	---	---	0
		12	*Sulphonamide*, 1 g. per kilo B. D. for 2 days, 0.7 g B. D. 3d day, 1 g per kilo daily 4th day, 0.5 g per kilo 5th and 6th days.	---	---	---	7	3	1	---	8
		6	*Prontosil*, 1 g per kilo B. D.	6	---	---	---	---	---	---	0
		6	*Prontosil soluble*, 1 g per kilo B. D.	6	---	---	---	---	---	---	0
	10^{-7}	2	None	1	---	---	---	---	---	---	0
	10^{-8}	2	None	1	1	---	---	---	---	---	50

[1] 2 died on 8th day.

TOXICITY

The toxicity of sulphonamide (p-aminobenzene sulphonamide) is quite low. The minimum lethal dose following single subcutaneous injections in olive oil is 6 grams per kilo body weight (table 4). With doses of 2 grams per kilo characteristic symptoms are produced. Within 3 or 4 hours there is observed marked spasticity of the extremities, occurring at first only when the animals are picked up. The extremities are held rigidly extended, and the lower half of the body is flexed so that the hind legs point anteriorly. With larger doses there is increasing spasticity, excitability, and incoordination. These symptoms disappear within 12 hours and the animals appear normal the next day.

TABLE 4.—*The toxicity of p-aminobenzene sulphonamide following single subcutaneous injections*

Number of mice	30 percent sulphonamide in oil subcutaneously	Deaths	Percent mortality
4	3 g per kilo	0	0
5	4 g per kilo	0	0
4	6 g per kilo	3	75

The toxicity following repeated administration of sulphonamide has also been studied. Doses of 1 g per kilo twice a day for 2 days followed by 0.5 g per kilo twice a day for 3 days were borne without symptoms. With 1.5 g per kilo twice daily for 2 days followed by 0.75 g per kilo for 3 days there was loss of weight for the first few days but no deaths. With 2 g per kilo twice a day for 2 days followed by

1 g per kilo twice a day for 3 days there was 50 percent mortality (table 5).[3]

TABLE 5.—*The toxicity of sulphonamide following repeated subcutaneous injections*

Number of mice	20 percent sulphonamide in oil, subcutaneously	Deaths	Percent mortality
	Grams per kilo		
4	0.5 g B. D. for 2 days, then once a day for 4 days	0	0
4	1 g B. D. for 2 days, once a day for 4 days	0	0
4	1.5 g B. D. for 2 days, once a day for 4 days	0	0
4	2 g B. D. for 2 days, once a day for 4 days	2	50

In our experiments we have accordingly employed doses approaching the maximum that can be tolerated without symptoms. The highest individual doses represented one-sixth of the minimum lethal dose.

COMPOUNDS RELATED TO SULPHONAMIDE

Studies are in progress to obtain a more effective compound against pneumococcus infections.

The following substances have been found devoid of chemotherapeutic activity:

Ortho-, meta-, and para-aminobenzene sulphonic acids. Meta-aminobenzene sulphonamide,[4] meta-nitrobenzene sulphonamide,[4] p-aminobenzene sulphinic[4] acid, p-acetyl aminobenzene sulphonamide,[4] p-aminobenzene sulphonyl chloride,[4] benzoylsulphimide.

CONCLUSIONS

p-aminobenzene sulphonamide has been found to possess chemotherapeutic activity against pneumococcus types I, II, and III infections in mice.

Work is in progress to obtain compounds of increased effectiveness for this purpose.

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(12) Colebrook, L., and Kenny, M.: Ibid., 1279 (1936).
(13) Nitti, F., and Bovet, D.: Compt. Rend. Soc. Biol., **119**; 1277 (1935).

[3] Histologic examination of these animals by Passed Assistant Surgeon L. L. Ashburn, of this Institute, revealed no significant lesions other than slight toxic splenitis.
[4] Prepared by Dr. James M. Johnson of this Institute.

PREVALENCE OF INFLUENZA IN EUROPE AND THE UNITED STATES

Under date of January 5, 1937, Dr. F. G. Boudreau, of the Health Section of the League of Nations, informed the Surgeon General of the Public Health Service that influenza was showing an unusually early seasonal tendency to assume epidemic proportions in Central and Northwestern Europe, especially in Berlin, Copenhagen, and London. Dr. Boudreau will keep the Public Health Service informed by cable concerning the further course of the disease in Europe.

Although there has been a slight seasonal increase in the prevalence of influenza in recent weeks, the situation is favorable in all sections of the United States at the present time. For the week ended January 2, 1937, 3,993 cases of influenza were reported to the Public Health Service by the health officers of 41 States, as compared with 1,786 cases for the corresponding week last year. For the week ended December 26, 1936, these States reported 2,088 cases, and for the corresponding week of last year 1,469 cases. The average number of cases reported by the 41 States for the last week of the year during the last 8 years is 29,800. This average, however, includes data for the years 1929 and 1932, when influenza was epidemic at the close of the year.

COURT DECISION ON PUBLIC HEALTH

Refusal to grant licenses as common victualers upheld.—(Supreme Judicial Court of Massachusetts; *Liggett Drug Co., Inc., et al.* v. *Board of License Com'rs of City of North Adams; J. J. Newberry* v. *Same*, 4 N. E. (2d) 628; decided Nov. 16, 1936.) The petitioners, owners of a chain of drug stores and a chain of 5- and 10-cent stores, respectively, brought this action to compel the licensing authorities of the city of North Adams to grant them licenses as common victualers. The laws of Massachusetts provided that the licensing authorities could grant licenses to persons to be common victualers but did not require such authorities to grant such licenses "if, in their opinion, the public good does not require it." Evidence was introduced to show that the places in which the food was prepared by the petitioners were insanitary, that the food was served for immediate consumption in rooms where merchandise was sold, and that it was the opinion of the licensing authorities that too many places had been licensed for public eating houses. The lower court refused to grant the relief requested by the petitioners. On appeal, this decision was affirmed. In the course of its opinion the court said:

The evidence already narrated warranted the single justice in finding that the places of business of the petitioners were unsanitary and not suitable for the preparation and sale of food. His general finding in favor of the respondents may

have rested on that ground. It is too clear for discussion that such a finding would be ample justification for denial by the respondents of the applications of the petitioners for licenses. The single justice may also have found that it was detrimental to the public health to serve food for immediate consumption in the room where the sale of merchandise was in progress. The opinion was expressed in *Re Interrogatories of the Governor*, 97 Colo. 587, 52 P. (2d) 663, 667, 668, that a determination that "the preparation and service of meals, in the same room where the sale of merchandise is actively carried on, is inimical to the public health" could not be pronounced an unreasonable exercise of the police power. The single justice may further have found that the decision of the respondents was supported by the facts that too many places had been licensed for public eating houses and that the welfare of the community would be promoted by diminishing that number, and that the methods of business of the petitioners conduced to impair the quality of food dispensed at all such places. It cannot be held that any of these findings was without support in evidence. Therefore the decision of the single justice in dismissing the petitions cannot be reversed. *Andrews* v. *Registrars of Voters of Easton*, 246 Mass. 572, 576, 141 N. E. 507; *Swift* v. *Registrars of Voters of Quincy*, 281 Mass. 271, 284, 183 N. E. 730. Each one of them appears to be a reasonable and nondiscriminatory test. No one of them appears to be designed to operate against the petitioners on grounds of prejudice, or whim, or caprice. The record does not show that the respondents were actuated by any unworthy motives. No inference of that nature is permissible in view of the action of the single justice in dismissing the petitions.

DEATHS DURING WEEK ENDED DECEMBER 19, 1936

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 19, 1936	Corresponding week, 1935
Data from 86 large cities of the United States:		
Total deaths	9,247	8,807
Deaths per 1,000 population, annual basis	12.9	12.3
Deaths under 1 year of age	559	550
Deaths under 1 year of age per 1,000 estimated live births	50	50
Deaths per 1,000 population, annual basis, 51 weeks of year	12.0	11.4
Data from industrial insurance companies:		
Policies in force	68,924,487	67,826,231
Number of death claims	13,208	13,014
Death claims per 1,000 policies in force, annual rate	10.0	10.0
Death claims per 1,000 policies, 51 weeks of year, annual rate	9.7	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 26, 1936, and Dec. 28, 1935

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 26, 1936, and Dec. 28, 1935

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935
New England States:								
Maine	3		6	2	21	129	0	0
New Hampshire					2	25	0	0
Vermont	1					169	0	0
Massachusetts	4	15			438	122	0	3
Rhode Island		1			28	42	0	1
Connecticut	1	1	4	6	119	48	1	0
Middle Atlantic States:								
New York	23	39	[1] 36	[1] 19	160	444	8	8
New Jersey	7	16	10	8	119	27	1	3
Pennsylvania	12	31			9	150	0	4
East North Central States:								
Ohio	20	47	4	11	16	60	4	3
Indiana	19	36	93	45	7	1	5	6
Illinois	30	52	164	35	7	22	4	11
Michigan	17	11	4		29	16	0	2
Wisconsin	18	2	116	65	30	84	2	1
West North Central States:								
Minnesota	5				8	32	3	1
Iowa	4	12	28		1	2	1	3
Missouri	19	33	50	97	2	12	1	2
North Dakota	2					1	0	1
South Dakota		2	1	1	1	2	0	3
Nebraska	2	2			2	65	0	0
Kansas	3	15	1	1	7	7	0	1
South Atlantic States:								
Delaware	3	1			52	28	0	0
Maryland [2]	21	8	14	8	77	39	2	4
District of Columbia	5	17	1		5		2	4
Virginia	23	47			38	50	1	4
West Virginia	24	11	47	113	20	8	5	4
North Carolina	39	22	14	12	5	2	1	1
South Carolina [3]	10	3	206	162	15		0	1
Georgia [3]	24	18	86	86			2	2
Florida	8	6		2	1	2	3	1
East South Central States:								
Kentucky	13	33	15	10	17	12	8	7
Tennessee	28	16	45	63	21	1	1	1
Alabama [3]	23	26	53	110	2	8	1	0
Mississippi [3]	6	7					2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 26, 1936, and Dec. 28, 1935—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935
West South Central States:								
Arkansas	7	9	35	36	3		2	1
Louisiana [3]	13	23	7	13	2	21	1	1
Oklahoma [4]	11	12	98	111	5		3	11
Texas [3]	67	110	756	324	137	15	5	13
Mountain States:								
Montana	1	4	35	7	2	5	0	0
Idaho			5		63	21	1	0
Wyoming				2		1	1	0
Colorado	4	6			5	9	0	0
New Mexico		3	6	3	22	3	0	0
Arizona	2	3	78	51	4		0	1
Utah		1			4	4	0	0
Pacific States:								
Washington	8				16	174	0	2
Oregon		3	25	36	3	310	1	0
California	43	40	45	40	19	217	3	3
Total	568	744	2,088	1,469	1,544	2,390	75	115
52 weeks	28,779	38,034	157,823	118,416	284,791	721,872	7,392	5,591

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935
New England States:								
Maine	0	2	19	26	0	0	1	3
New Hampshire	0	0	4	12	0	0	0	0
Vermont	0	0	8	5	0	0	0	0
Massachusetts	0	3	153	236	0	0	1	2
Rhode Island	0	2	5	23	0	0	0	0
Connecticut	0	1	49	50	0	0	0	0
Middle Atlantic States:								
New York	0	2	402	485	21	0	5	12
New Jersey	0	6	71	137	0	0	0	4
Pennsylvania	0	5	85	302	0	0	3	12
East North Central States:								
Ohio	0	0	215	365	5	3	5	2
Indiana	0	0	128	168	5	5	1	0
Illinois	1	3	327	499	0	5	0	4
Michigan	1	0	301	201	0	3	7	1
Wisconsin	0	0	258	416	7	16	0	2
West North Central States:								
Minnesota	0	0	114	254	8	17	3	1
Iowa	0	2	102	141	7	2	4	0
Missouri	0	0	104	121	9	4	6	4
North Dakota	0	0	60	31	13	5	2	1
South Dakota	0	0	62	35	5	8	0	1
Nebraska	0	0	46	170	10	61	0	0
Kansas	0	0	234	116	6	17	1	0
South Atlantic States:								
Delaware	0	0	8	5	0	0	0	0
Maryland [2]	0	1	59	56	0	0	4	12
District of Columbia	0	0	12	14	0	0	1	3
Virginia	1	1	26	48	0	0	5	5
West Virginia	0	0	63	77	0	0	7	2
North Carolina	0	1	31	53	0	0	2	6
South Carolina [3]	0	0	8	9	0	0	0	0
Georgia [3]	1	0	20	27	0	0	5	3
Florida	1	0	1	9	0	0	0	1
East South Central States:								
Kentucky	0	0	58	53	0	0	2	3
Tennessee	3	0	38	36	0	0	11	5
Alabama [3]	1	4	15	11	0	0	7	7
Mississippi [2]	0	0	10	11	0	0	0	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 26, 1936, and Dec. 28, 1935—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28, 1935	Week ended Dec. 26, 1936	Week ended Dec. 28 1935
West South Central States:								
Arkansas	1	1	16	8	0	0	1	8
Louisiana [3]	1	0	12	14	0	0	2	4
Oklahoma [4]	3	0	36	31	0	0	5	12
Texas [3]	3	2	112	117	3	1	13	9
Mountain States:								
Montana	0	0	39	243	16	14	0	0
Idaho	0	0	26	53	3	1	0	0
Wyoming	0	0	6	86	0	2	0	1
Colorado	0	0	24	143	1	2	0	0
New Mexico	0	0	17	50	0	0	10	4
Arizona	0	0	8	13	0	0	0	0
Utah	0	0	8	83	0	0	0	0
Pacific States:								
Washington	0	0	80	66	4	23	1	1
Oregon	0	0	27	48	18	1	0	1
California	4	4	214	234	11	3	8	10
Total	21	40	3,721	5,391	152	193	123	149
52 weeks	4,493	107,82	233,944	251,583	7,459	7,490	14,611	17,491

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 26, 1936, 47 cases, as follows: South Carolina, 2; Georgia, 18; Alabama, 14; Louisiana, 1; Texas, 12.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1936										
New Hampshire	2	2					2	28	0	0
November 1936										
Alabama	5	203	223	722	4	5	7	106	0	33
Illinois	23	148	55	7	47		70	1,271	8	70
Indiana	6	121	44		25		6	438	7	5
Kansas	8	66	5		19	2	11	726	41	21
Minnesota	2	103	6		88		5	576	9	8
Mississippi	4	75	3,628	2,819	93	190	13	98	0	22
Montana	3	8	44		12		0	227	87	6
North Dakota		7	75		5		8	206	50	4
Oklahoma [1]	8	56	260	27	19	2	64	90	2	55
Oregon	4	2	110	1	29		8	144		11
Tennessee	17	174	185	51	12	7	23	242	1	53
Texas	6	178	367	1,308	71	13	10	198	5	58
Virginia	19	245	532	84	96	6	7	235	0	86
Washington	5	6	33		35		7	200	9	9

[1] Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

November 1936

	Cases
Actinomycosis:	
Minnesota	1
Chicken pox:	
Alabama	49
Illinois	1,106
Indiana	413
Kansas	396
Minnesota	682
Mississippi	345
Montana	343
North Dakota	91
Oklahoma [1]	40
Oregon	210
Tennessee	132
Texas	65
Virginia	179
Washington	847
Dysentery:	
Alabama (amoebic)	4
Illinois (amoebic)	8
Illinois (amoebic carriers)	18
Illinois (bacillary)	17
Kansas (amoebic)	1
Kansas (bacillary)	2
Minnesota (amoebic)	7
Minnesota (bacillary)	12
Mississippi (amoebic)	81
Mississippi (bacillary)	396
Montana (amoebic)	1
Montana (unspecified)	1
Oklahoma [1]	14
Tennessee (amoebic)	3
Tennessee (bacillary)	14
Texas (amoebic)	1
Texas (bacillary)	14
Virginia (amoebic)	1
Virginia (bacillary, diarrhea included)	125
Washington (bacillary)	5
Encephalitis, epidemic or lethargic:	
Alabama	3
Illinois	7
Kansas	4
Oklahoma [1]	2
Oregon	1
Tennessee	1
Virginia	1
Washington	2
German measles:	
Alabama	10
Illinois	37
Kansas	3
Montana	8
Tennessee	3
Washington	22
Hookworm disease:	
Mississippi	278

	Cases
Impetigo contagiosa:	
Oregon	96
Tennessee	2
Lead poisoning:	
Illinois	1
Mumps:	
Alabama	78
Illinois	189
Indiana	48
Kansas	320
Mississippi	143
Montana	348
North Dakota	90
Oklahoma [1]	102
Oregon	42
Tennessee	44
Texas	77
Virginia	89
Washington	160
Ophthalmia neonatorum:	
Alabama	1
Illinois	3
Mississippi	4
Oklahoma [1]	1
Tennessee	1
Paratyphoid fever:	
Kansas	5
Oregon	2
Texas	1
Puerperal septicemia:	
Mississippi	22
Tennessee	2
Rabies in animals:	
Alabama	68
Illinois	25
Indiana	41
Mississippi	27
Texas	5
Washington	11
Scabies:	
Kansas	2
Oklahoma [1]	4
Oregon	60
Tennessee	5
Washington	1
Septic sore throat:	
Illinois	3
Kansas	5
Minnesota	6
Montana	2
Oklahoma [1]	27
Oregon	5
Tennessee	4
Virginia	15
Washington	1
Tetanus:	
Illinois	4
Kansas	2

	Cases
Tetanus—Continued.	
Oklahoma [1]	2
Tennessee	4
Virginia	1
Washington	1
Trachoma:	
Illinois	122
Mississippi	7
Montana	5
Oklahoma [1]	5
Tennessee	32
Virginia	1
Washington	1
Tularemia:	
Illinois	8
Kansas	7
Minnesota	2
Virginia	6
Typhus fever:	
Alabama	29
Mississippi	2
Tennessee	1
Texas	18
Undulant fever:	
Alabama	2
Illinois	8
Indiana	1
Kansas	22
Minnesota	8
Mississippi	1
Oklahoma [1]	3
Oregon	1
Tennessee	4
Texas	1
Washington	1
Vincent's infection:	
Illinois	46
Kansas	7
North Dakota	4
Oklahoma [1]	5
Oregon	10
Tennessee	4
Washington	2
Whooping cough:	
Alabama	24
Illinois	774
Indiana	82
Kansas	78
Minnesota	147
Mississippi	203
Montana	68
North Dakota	1
Oklahoma [1]	1
Oregon	97
Tennessee	111
Texas	267
Virginia	263
Washington	83

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 19, 1936

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	6	4	0	0	0	5	42
New Hampshire:											
Concord	0	------	0	0	1	0	0	0	0	0	13
Manchester	0	------	0	0	3	0	0	0	0	0	15
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	3
Burlington	0	------	0	0	0	0	0	0	0	0	13
Rutland	0	------	0	0	0	1	0	0	0	0	7
Massachusetts:											
Boston	2	------	1	17	30	70	0	9	1	184	237
Fall River	0	------	0	1	3	3	0	2	0	2	37
Springfield	0	------	0	2	0	2	0	0	0	10	36
Worcester	0	------	0	17	12	1	0	2	0	21	59
Rhode Island:											
Pawtucket	0	------	0	1	0	2	0	0	0	0	22
Providence	0	------	0	17	3	18	0	2	0	13	59
Connecticut:											
Bridgeport	0	1	1	21	4	3	0	0	0	4	40
Hartford	0	------	0	0	4	7	0	2	0	12	49
New Haven	0	1	0	1	1	3	0	0	0	1	59
New York:											
Buffalo	0	1	1	48	13	16	0	3	0	12	135
New York	24	23	4	46	122	172	0	84	4	95	1,586
Rochester	0	------	2	0	12	5	0	2	0	5	69
Syracuse	1	------	0	22	4	19	0	0	0	35	57
New Jersey:											
Camden	4	------	1	0	1	4	0	0	0	5	44
Newark	0	1	0	82	12	7	0	9	0	29	115
Trenton	0	------	0	1	4	2	0	2	0	2	59
Pennsylvania:											
Philadelphia	4	------	1	3	43	96	0	27	0	118	521
Pittsburgh	5	------	8	0	29	68	0	11	0	40	172
Reading	0	------	0	0	6	4	0	1	0	31	40
Scranton	0	------	------	0	------	12	0	------	0	0	------
Ohio:											
Cincinnati	4	------	2	5	16	16	0	11	0	0	160
Cleveland	7	9	1	1	13	42	0	17	0	31	200
Columbus	3	1	1	1	8	8	0	2	1	12	94
Toledo	3	------	0	1	3	14	0	3	1	33	75
Indiana:											
Anderson	0	------	1	0	0	17	0	1	0	3	7
Fort Wayne	2	------	0	0	4	5	0	2	0	0	23
Indianapolis	2	------	3	3	10	16	0	2	0	8	108
Muncie	1	------	0	0	3	2	0	0	0	0	11
South Bend	0	------	0	0	1	2	0	0	0	6	13
Terre Haute	1	------	0	0	0	2	0	0	0	0	23
Illinois:											
Alton	2	------	0	0	1	3	0	0	0	1	11
Chicago	9	110	8	22	97	204	0	45	1	66	947
Elgin	0	------	0	0	1	1	0	1	0	21	8
Moline	0	------	0	0	2	0	0	0	0	0	10
Springfield	0	2	0	0	3	4	0	0	0	18	25
Michigan:											
Detroit	8	4	3	3	23	178	0	15	4	104	288
Flint	------	------	------	------	------	------	------	------	------	------	------
Grand Rapids	0	------	0	0	2	13	0	0	3	25	24
Wisconsin:											
Kenosha	0	------	0	0	0	9	0	0	0	4	13
Madison	0	------	0	0	3	12	0	1	0	2	24
Milwaukee	0	------	0	3	6	39	0	4	0	42	90
Racine	------	------	------	------	------	------	------	------	------	------	------
Superior	0	------	0	0	3	3	0	0	0	1	11

City reports for week ended Dec. 19, 1936—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Minnesota:											
Duluth	0		0	0	2	26	0	0	0	6	24
Minneapolis	5		0	3	11	9	0	0	0	17	90
St. Paul	0		0	2	12	4	0	2	0	35	71
Iowa:											
Cedar Rapids	0			0		0	0		0	0	
Des Moines	1		0	0	0	11	0	0	0	1	34
Sioux City	0			0		11	2		0	0	
Waterloo	2			0		1	0		0	12	
Missouri:											
Kansas City	2		0	2	9	37	1	8	0	3	109
St. Joseph											
St. Louis	8	2	0	3	12	19	0	14	1	24	224
North Dakota:											
Fargo	0		0	0	1	0	0	0	0	0	10
Grand Forks	0			0		0	0		0	0	
Minot	0		0	0	0	0	0	0	0	0	5
South Dakota:											
Aberdeen	0			0		8	0		0	0	
Sioux Falls	0		0	0	0	5	0	0	0	0	8
Nebraska:											
Omaha	4		0	3	5	6	0	1	0	1	62
Kansas:											
Lawrence	0		0	0	1	0	0	0	0	0	6
Topeka	0		1	1	3	3	0	1	0	0	22
Wichita	0		0	0	8	2	0	1	1	0	29
Delaware:											
Wilmington	0		0	38	2	0	0	0	0	1	22
Maryland:											
Baltimore	5	9	3	120	21	23	0	21	0	108	237
Cumberland	0		0	0	3	3	0	0	0	0	14
Frederick	0		0	1	1	0	0	0	0	0	5
Dist. of Col.:											
Washington	10		0	6	13	16	0	9	3	33	156
Virginia:											
Lynchburg	3		0	0	3	0	0	1	0	3	14
Richmond	0		1	0	7	9	0	5	1	0	62
Roanoke	0		0	0	0	2	0	0	0	0	27
West Virginia:											
Charleston											
Huntington	2			0		5	0		0	0	
Wheeling	0		0	1	8	0	0	0	0	4	11
North Carolina:											
Gastonia	0		0	0	0	0	0	0	0	0	
Raleigh	2		0	0	0	1	0	0	0	0	9
Wilmington	1	0		0	1	0	0	0	0	0	14
Winston-Salem	2	1	0	0	7	0	0	0	2	0	20
South Carolina:											
Charleston	0	28	0	0	0	2	0	1	0	0	25
Columbia	0		0	0	2	0	0	0	0	0	13
Florence	0		0	0	2	0	0	0	0	0	12
Georgia:											
Atlanta	6	14	1	0	16	11	0	0	0	0	113
Brunswick	0		0	1	1	0	0	0	0	0	3
Savannah	2	11	1	0	3	0	0	0	2	1	27
Florida:											
Miami	0	1	0	2	1	2	0	3	0	1	45
Tampa	3		0	0	2	0	0	2	0	1	29
Kentucky:											
Ashland	0		1	0	7	1	0	1	0	0	36
Covington	1		0	0	4	2	0	0	0	0	
Lexington	0		0	0	3	0	0	2	0	0	26
Tennessee:											
Knoxville	0		0	1	2	2	0	3	0	0	18
Memphis	2		1	0	7	9	0	4	0	2	84
Nashville	2		0	0	9	2	0	4	1	0	61
Alabama:											
Birmingham	2	9	1	2	6	5	0	4	0	4	67
Mobile	0	4	1	2	3	2	0	0	0	0	29
Montgomery	1	3		0		2	0		0	6	
Arkansas:											
Fort Smith	0			0		6	0		0	0	
Little Rock	0		0	1	2	1	0	2	0	0	4
Louisiana:											
Lake Charles	1		0	0	1	0	0	0	0	0	8
New Orleans	8		4	0	22	9	0	9	0	0	188
Shreveport	0		0	0	6	1	0	2	0	0	36

City reports for week ended Dec. 19, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Oklahoma:											
Oklahoma City	0	------	1	0	10	6	0	1	0	0	42
Tulsa	0	------	------	1	------	0	0	------	0	0	------
Texas:											
Dallas	2	------	0	1	8	7	0	5	0	2	63
Fort Worth	2	------	0	40	2	8	0	0	0	0	84
Galveston	0	------	0	0	5	1	0	8	0	0	18
Houston	12	------	0	0	10	4	0	8	0	8	86
San Antonio	4	------	4	0	5	1	0	6	0	0	57
Montana:											
Billings	0	------	0	0	2	0	0	0	0	0	8
Great Falls	0	------	0	0	2	1	1	0	0	1	5
Helena	0	------	0	0	0	6	0	0	0	0	0
Missoula	0	------	0	0	2	0	0	0	0	0	6
Idaho:											
Boise	0	------	1	0	2	3	0	0	0	0	12
Colorado:											
Colorado Springs	0	------	0	0	3	2	0	1	0	0	14
Denver	8	------	3	0	12	6	0	8	1	50	90
Pueblo	0	------	0	0	3	4	0	0	0	1	11
New Mexico:											
Albuquerque	0	------	0	1	3	3	0	2	1	0	13
Utah:											
Salt Lake City	0	------	1	5	4	13	0	1	0	7	42
Nevada:											
Reno	------	------	------	------	------	------	------	------	------	------	------
Washington:											
Seattle	1	------	1	3	5	3	0	4	1	9	90
Spokane	0	------	0	2	9	4	0	1	0	1	34
Tacoma	0	------	0	1	2	5	0	0	0	0	24
Oregon:											
Portland	1	1	1	0	12	5	0	2	0	10	95
Salem	0	2	------	1	------	0	0	------	0	0	------
California:											
Los Angeles	9	16	0	4	33	30	0	21	1	45	349
Sacramento	0	1	1	0	7	27	0	6	0	0	42
San Francisco	4	------	3	3	13	17	0	7	0	14	182

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Georgia:			
Boston	2	3	0	Atlanta	2	1	0
New York:				Florida:			
New York	7	2	0	Tampa	0	1	0
Pennsylvania:				Tennessee:			
Philadelphia	2	1	0	Knoxville	1	0	0
Ohio:				Memphis	0	1	0
Cincinnati	3	0	0	Alabama:			
Cleveland	2	0	1	Birmingham	1	0	0
Toledo	0	1	0	Arkansas:			
Illinois:				Fort Smith	1	0	0
Chicago	5	3	0	Louisiana:			
Iowa:				New Orleans	0	1	0
Des Moines	2	0	0	Shreveport	0	3	0
Missouri:				Oklahoma:			
Kansas City	1	0	0	Oklahoma City	1	0	0
St. Louis	1	0	0	Tulsa	0	0	4
Kansas:				Texas:			
Wichita	0	0	1	Houston	2	0	1
Maryland:				Oregon:			
Baltimore	4	1	0	Portland	0	0	2
District of Columbia:				Salem	1	0	0
Washington	3	1	0	California:			
South Carolina:				Los Angeles	3	2	1
Charleston	1	1	0				

Pellagra.—Cases: Atlanta, 1; Savannah, 3; Birmingham, 2; New Orleans, 1; Los Angeles, 4; San Francisco, 1.

Typhus fever.—Cases: Savannah, 3; Montgomery, 1; Shreveport, 1; Galveston, 1; Houston, 1.

FOREIGN AND INSULAR

CANADA

Vital statistics—Second quarter 1936.—The Bureau of Statistics of the Dominion of Canada has published the following preliminary statistics for the second quarter of 1936. The rates are computed on an annual basis. There were 20.4 live births per 1,000 population during the second quarter of 1936 and 21.5 per 1,000 population in the same quarter of 1935. The death rate was 9.8 per 1,000 population for the second quarter of 1936 and 11.1 per 1,000 population for the same quarter of 1935. The infant mortality rate for the second quarter of 1936 was 66 per 1,000 live births and 73 per 1,000 live births in the corresponding quarter of 1935. The maternal death rate was 5.7 per 1,000 live births for the second quarter of 1936 and 5.3 per 1,000 live births for the same quarter of 1935.

The accompanying tables give the numbers of births, deaths, and marriages by Provinces for the second quarter of 1936, and deaths from certain causes in Canada for the second quarter of 1936, and the corresponding quarter of 1935, and by Provinces for the second quarter of 1936.

Number of births, deaths, and marriages, second quarter 1936

Province	Live births	Deaths (exclusive of still births)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	56,060	26,852	3,693	318	20,841
Prince Edward Island	503	240	24	4	116
Nova Scotia	2,761	1,820	208	9	923
New Brunswick	2,725	1,211	194	20	709
Quebec	19,564	8,200	1,604	128	6,139
Ontario	15,923	9,451	853	84	7,692
Manitoba	3,300	1,424	172	15	1,820
Saskatchewan	4,738	1,545	242	21	1,088
Alberta	3,876	1,626	267	24	1,837
British Columbia	2,670	1,835	129	13	1,517

[1] Exclusive of Yukon and the Northwest Territories.

Number of deaths, Canada, second quarter of 1935 and 1936, and by Provinces for second quarter of 1936

Cause of death	Canada [1] (second quarter)		Province, second quarter 1936								
	1935	1936	Prince Edward	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	241	259	2	13	10	73	110	10	8	11	22
Cancer	2,871	2,849	27	127	121	758	1,069	180	164	162	241
Diarrhea and enteritis	514	478		8	19	262	93	21	18	40	17
Diphtheria	50	47	1	6	4	28	5	1	2		
Diseases of the arteries	2,122	2,342	18	107	74	416	1,255	117	92	112	151
Diseases of the heart	4,117	4,098	86	178	183	953	1,804	216	232	194	302
Homicides	49	33		1		7	14	2	2	1	6
Influenza	961	814	8	55	26	269	172	39	74	121	50
Measles	174	108	1	2	11	26	30	19	6	8	5
Nephritis	1,637	1,625	16	76	47	745	466	66	65	52	92
Pneumonia	2,104	1,882	28	100	109	537	668	107	113	108	112
Poliomyelitis	15	7				4	1	2			
Puerperal causes	308	318	4	9	20	128	84	15	21	24	18
Scarlet fever	60	55		3		23	19	5	2	3	
Suicides	225	253	1	5	5	36	115	15	26	21	29
Tuberculosis	1,872	1,938	18	121	101	824	428	107	82	97	160
Typhoid fever	53	64		1	2	38	3	5	5	7	3
Other violent deaths	1,093	1,044	10	89	26	273	387	57	80	80	92
Whooping cough	219	133	2	18	12	28	28	2	14	22	7

[1] Exclusive of Yukon and the Northwest Territories.

CZECHOSLOVAKIA

Communicable diseases—September 1936.—During the month of September 1936, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	9	1	Paratyphoid fever	28	3
Cerebrospinal meningitis	13	3	Poliomyelitis	41	2
Chicken pox	66		Puerperal fever	48	23
Diphtheria	2,140	114	Scarlet fever	2,453	40
Dysentery	130	21	Trachoma	105	
Influenza	44	4	Typhoid fever	1,014	60
Lethargic encephalitis	1	1	Typhus fever	1	
Malaria	221	1			

ITALY

Communicable diseases—4 weeks ended October 11, 1936.—During the 4 weeks ended October 11, 1936, certain communicable diseases were reported in Italy as follows:

Disease	Sept. 14-20 Cases	Sept. 14-20 Communes affected	Sept. 21-27 Cases	Sept. 21-27 Communes affected	Sept. 28-Oct. 4 Cases	Sept. 28-Oct. 4 Communes affected	Oct. 5-11 Cases	Oct. 5-11 Communes affected
Anthrax	40	34	20	28	44	32	30	29
Cerebrospinal meningitis	9	9	11	11	10	10	11	11
Chicken pox	61	44	69	52	123	59	69	53
Diphtheria and croup	541	272	519	288	572	297	544	306
Dysentery	34	24	32	27	27	20	36	19
Hookworm disease	8	6	9	9	14	8	8	4
Lethargic encephalitis	2	1	1	1	2	2	1	1
Measles	236	105	345	105	212	85	235	84
Mumps	74	40	59	44	54	33	61	37
Paratyphoid fever	140	98	161	120	122	94	151	110
Poliomyelitis	72	52	48	41	40	38	55	46
Puerperal fever	31	26	34	32	52	50	29	26
Scarlet fever	298	158	292	146	258	138	308	154
Typhoid fever	979	499	967	492	863	466	811	431
Undulant fever	33	30	27	25	38	33	29	26
Whooping cough	282	105	327	120	320	121	293	106

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for December 25, 1936, pages 1803–1815. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued January 29, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Indochina—Cochinchina—Vinlong.—During the week ended December 19, 1936, 1 case of cholera was reported in Vinlong, Cochinchina, Indochina.

Yellow Fever

Senegal—Khombole.—On November 2, 1936, 1 case of yellow fever was reported in Khombole, Senegal.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 52 JANUARY 15, 1937 No. 3

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

November 29–December 26, 1936

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—Reported cases of influenza show a considerable increase for the week ended January 2, 1937; the West South Central, Mountain, West North Central, East North Central, and Middle Atlantic sections reported approximately 10 times as many cases as for the corresponding weeks of 1932 or 1934 (table 1), two winters of fairly average influenza incidence. With the exception of the West South Central section, these areas did not show a decided increase in reported cases during December. Texas, however, in the West South Central section has reported slightly more than the average number of cases for 5 weeks; that is, from November 29, 1936, to January 2, 1937. The largest number of cases reported in Texas was for the week ended December 26, a somewhat smaller number being reported for the week ended January 2. The New England, South Atlantic, and Pacific Coast States show only an average number of cases for this season of the year. California, which had an unusual flurry of cases in the early summer—that is, during the 5 weeks from May 31 to July 4, 1936—has shown only the seasonal expectancy during the fall and early winter. In the country as a whole there has not been an alarming number of cases of influenza reported, though from December 13 to January 2 the number has been in excess of the average, and during the last week for which reports are available, that ended January 2, the area reporting an excess of cases has spread from the West South Central to the Mountain and to the West North Central, East North Central, and Middle Atlantic areas.

[1] From the Office of Statistical Investigations, U. S Public Health Service. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers The numbers of States included for the various diseases are as follows: Typhoid fever, 48, poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48, measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

Mortality from all causes in 95 large cities during the week ended January 2, 1937, shows a marked increase over normal expectancy, 14.5 per 1,000 in 1937 as compared with 13.0 for the same week of 1934. New York and Chicago had similar high rates for the same week.

Cases of influenza reported in each geographic area from Nov. 1, 1936, to Jan. 2, 1937

Region	Week ended—								
	Nov. 7	Nov. 14	Nov. 21	Nov. 28	Dec. 5	Dec. 12	Dec. 19	Dec. 26	Jan. 2
All regions:[1]									
1936-37	717	970	913	1,050	1,701	1,971	2,225	2,088	3,993
1933-34 [2]	999	1,009	1,107	1,481	1,431	1,311	1,105	1,158	2,051
1931-32 [2]	1,040	868	819	851	987	873	602	1,092	1,211
New England:									
1936-37	3	6	4	10	4	2	10	10	21
1933-34	2	4	19	6	16	19	16	23	35
1931-32	8	18	3	17	11	24	15	20	25
Middle Atlantic:									
1936-37	26	13	30	25	19	44	43	46	513
1933-34	38	30	40	49	44	58	38	32	48
1931-32	22	18	27	29	22	21	20	32	51
East North Central:									
1936-37	54	97	55	59	90	129	249	331	1,001
1933-34	189	82	86	246	100	194	110	204	143
1931-32	52	25	52	21	125	13	25	76	80
West North Central:									
1936-37	51	72	59	143	71	60	97	80	263
1933-34	9	22	17	9	14	10	11	15	27
1931-32	322	7	21	10	8	9	9	10	20
South Atlantic:									
1936-37	226	385	364	258	424	509	706	368	621
1933-34	418	451	484	673	689	511	547	403	1,102
1931-32	461	569	544	540	530	507	322	540	536
East South Central:									
1936-37	92	94	96	184	165	311	207	113	286
1933-34	86	71	100	137	142	185	85	82	168
1931-32	60	73	50	35	58	44	52	101	99
West South Central:									
1936-37	159	185	191	209	729	663	652	896	503
1933-34	188	248	189	224	299	239	186	292	400
1931-32	36	46	41	82	99	81	41	77	157
Mountain:									
1936-37	57	67	31	64	75	78	164	124	692
1933-34	23	24	81	66	62	27	65	48	38
1931-32	9	12	15	15	11	13	5	10	25
Pacific:									
1936-37	49	51	83	98	124	175	97	70	93
1933-34	46	77	91	71	65	68	47	59	90
1931-32	76	100	66	102	123	161	113	226	168

[1] No reports were received from Mississippi, Nevada, up-State New York, Pennsylvania, or Virginia.
[2] Reported cases for the corresponding weeks of 1933-34 and 1931-32, 2 winters of average influenza incidence.

Poliomyelitis.—For the 4 weeks ended December 26, 1936, there were 201 cases of poliomyelitis reported, as compared with 232, 185, and 136 for the corresponding period in the years 1935, 1934, and 1933, respectively. All sections of the country reported the usual seasonal decline, but in the North and South Central regions, where the disease was most prevalent during the rise of the summer of 1936, the numbers of cases were still slightly above those of last year. Other regions reported about the expected incidence.

Measles.—The reported incidence of measles, 6,801 cases, is low as compared with recent years. For this period in the 3 preceding years the numbers of cases totaled approximately 10,000, 20,000, and 30,000 for 1935, 1934, and 1933, respectively. In the South Atlantic

and South Central regions the disease appeared to be slightly more prevalent than it was at this time last year, but all other regions reported fewer cases. The recorded number of cases of measles remained at a very low level during 1936.

Scarlet fever.—For the country as a whole, the incidence of scarlet fever for the 4-week period under report was about 70 percent of that reported for the corresponding period in 1935, a year in which the disease was unusually high. The number of cases for this period, 17,630, was about the average for the 6 preceding years. In the North Atlantic regions the number of cases was somewhat lower than the seasonal expectancy while in the West North Central region, where a large number of cases have been continually reported during the past 2 years, the incidence is still high in relation to more normal years. Other regions reported about the normal incidence.

Smallpox.—The number of cases of smallpox rose from 333 for the preceding 4 weeks to 636 for the current 4-week period. The incidence was only about 80 percent of that for the corresponding period in 1935, but it was more than 25 percent in excess of the incidence during this period in each of the 3 preceding years. With the exception of 67 cases in New York, the increases occurred in practically the same States of the North Central, Mountain, and Pacific regions in which the disease has been continuously prevalent for the past 2 years. Oregon reported 113 cases; Montana, 87; South Dakota, 45; Iowa and North Dakota, 43 each; Wisconsin, 37; and Kansas, 36. More than three-fourths of the total cases occurred in those States.

Typhoid fever.—The number of reported cases of typhoid fever for the current period was 754, approximately the same as was reported for the corresponding period in 1935. In 1934, 1933, and 1932 the numbers of cases for this period were 1,039, 995, and 680, respectively. The situation was very favorable in all sections of the country. Slight increases over last year were reported from the North Central regions, but in the South Central regions the disease was less prevalent than at this time last year, and in the other regions it stood at about last year's level.

Diphtheria.—Diphtheria again registered a record low level. The 3,031 cases reported for the current 4 weeks was the lowest recorded for this period in the 8 years for which these data are available. The current incidence compares with a total of 8,154 for this period in 1929 and 7,246 for the same period in 1931. A comparison of geographic regions shows an increase in the South Atlantic region over each of the 2 preceding years, while in the Mountain and Pacific regions the current incidence was the highest in 3 years. Other regions continued to report the lowest incidence in recent years.

Meningococcus meningitis.—For the 4 weeks ended December 26, 1936, there were 405 cases of meningococcus meningitis reported, repre-

senting a decline of less than 10 percent from the incidence for the corresponding period in 1935. This disease has stood at a relatively high level since the beginning of 1935, and while the cases during the latter part of the current year have dropped below those of last year they are still the highest since the epidemics of 1929 and 1930. In 1929 and 1930 the numbers of cases for this period were 699 and 372, respectively. Regions along the Atlantic coast and the Mountain and Pacific regions reported excesses in the current period over last year; the South Central and West North Central regions reported fewer cases, and in the East North Central approximately the same incidence was recorded as that for last year.

Deaths, all causes.—The average mortality rate from all causes in large cities as reported by the Bureau of the Census for the 4 weeks ended December 26, 1936, was 12.3 per 1,000 inhabitants (annual basis). The rates for the corresponding period in the years 1935, 1934, and 1933 were 12.3, 12.2, and 12.1, respectively. By weeks for the current period the rates were 12.2, 12.3, 12.9, and 11.9, respectively.

DISTRIBUTION OF TUBERCULOSIS MORTALITY IN THE WHITE POPULATION OF THE UNITED STATES

By C. C. Dauer, M. D., *Department of Preventive Medicine, Tulane University of Louisiana, New Orleans, La.*

About two years ago a study of tuberculosis mortality by counties in southeastern United States was undertaken. One report on that study has been published [1] and another is now in press.[2] By request of some individuals interested in the epidemiology of tuberculosis, and with the aid of a grant from the National Tuberculosis Association, the study of mortality by counties has been continued. This paper, which is a preliminary report of the study, presents briefly the distribution of tuberculosis mortality in the white population for the entire country from 1929 to 1934.

The data on mortality by counties were secured from three sources. In approximately one-half of the States, the State bureaus of vital statistics cooperated by furnishing data by counties in which white and colored deaths were tabulated separately. The State tuberculosis association rendered valuable assistance in collecting data in two States. The remainder of the figures were taken from tabulations made by the division of vital statistics of the Bureau of the Census in Washington, D. C. Acknowledgment is given here to all who contributed information or made available the data necessary for the purpose of this study.

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[1] Some features of tuberculosis mortality distribution in the United States. By L. L. Lumsden and C. C. Dauer. Public Health Bulletin No. 225. Government Printing Office, Washington, D. C., 1936.

[2] The distribution of tuberculous mortality in southeastern United States. By C. C. Dauer and L. L. Lumsden. American Review of Tuberculosis. (In press.)

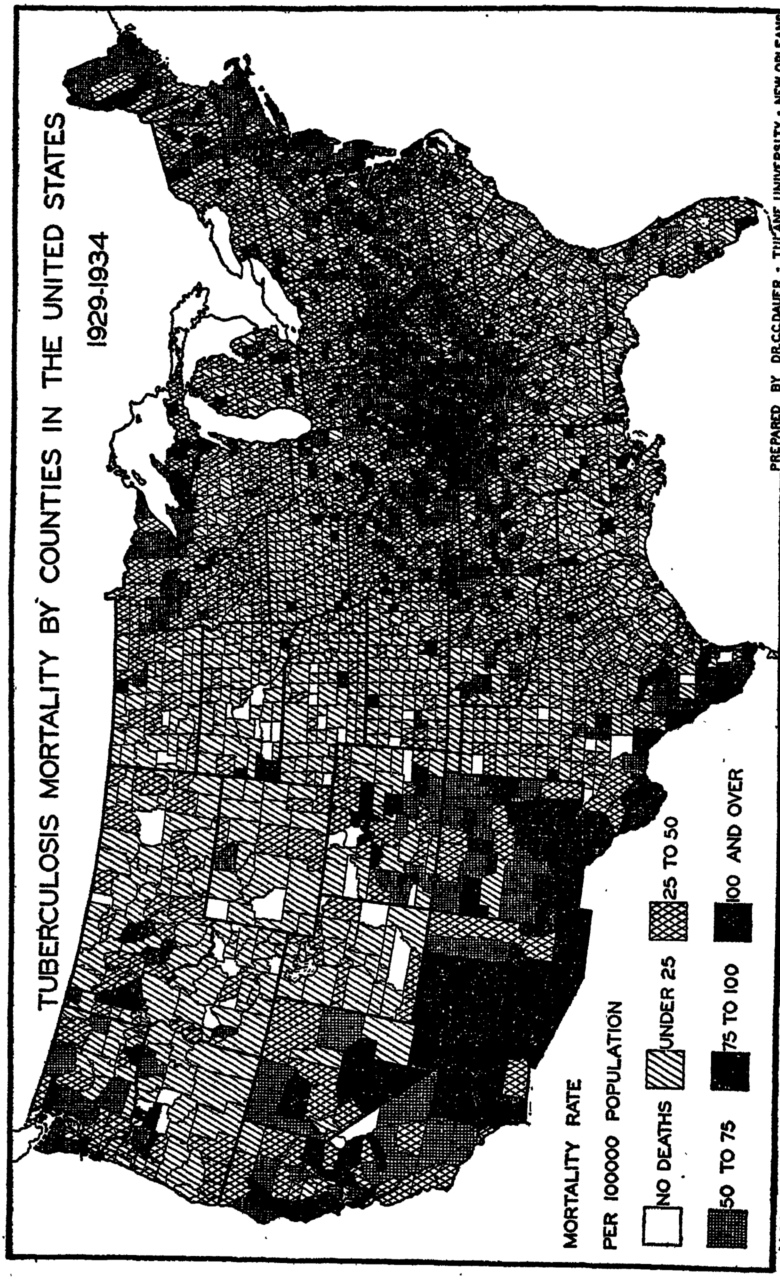
The map which accompanies this report is a graphic presentation of the data assembled. It shows the distribution of mortality from tuberculosis by counties for the white population. The study of the distribution of mortality for the colored population has not been extended to include the entire country, since only in the southeastern section of the country is the concentration of colored persons sufficient to give a fairly accurate picture of the distribution of tuberculosis death rates in that group. The distribution among colored persons in southeastern United States was presented in a previous report.[3]

TABLE 1.—*States in which all tuberculosis deaths in colored persons were excluded, and States in which tuberculosis deaths in colored persons were excluded in counties having 10 percent or more of colored population in 1930*

All tuberculosis deaths in colored persons excluded	Tuberculosis deaths in colored persons excluded in counties with 10 percent or more of colored population.
Alabama.	California.
Arkansas.	Colorado.
Arizona.	Connecticut.
Delaware.	Indiana.
Florida.	Iowa.
Georgia.	Maine.
Idaho.	Massachusetts.
Illinois.	Michigan.
Kansas.	Missouri.
Kentucky.	Montana.
Louisiana.	Nebraska.
Maryland.	Nevada.
Minnesota.	New Hampshire.
Mississippi.	New York.
New Jersey.	North Dakota.
New Mexico.	Oklahoma.
North Carolina.	Oregon.
Ohio.	Pennsylvania.
Rhode Island.	Utah.
South Carolina.	Vermont.
South Dakota.	Washington.
Tennessee.	West Virginia.
Texas.	Wyoming.
Virginia.	
Wisconsin.	

In compiling the data on tuberculosis deaths it was possible to exclude all but a few deaths among colored persons. All deaths in the colored population were excluded for 25 States, as indicated in table 1. For the remaining States they were separated for all counties having 10 percent or more of colored population in 1930. A considerable number were also excluded where data for large cities were available by color but not for the county as a whole. It is felt that the deaths for colored which could not be excluded were in no instance sufficiently large in number to change materially the general picture of the distribution as shown on the map.

[3] Public Health Bulletin No. 225.



Map showing tuberculosis mortality by counties in the white population of the United States, 1929–1934

Whenever possible the number of deaths corrected for residence of the decedents was used, and then only if the figures for a full 5-year period were available.[4] The consequence is that in most States, as shown on the map, there are isolated counties with a very high death rate from tuberculosis in the midst of many with low mortality. In these counties are located State sanatoria or other institutions caring for nonresident tuberculosis patients. Except in the more thickly populated States, correction for residence makes little or no change in the general picture of the distribution.

The mortality rates for each county are average annual rates per 100,000 population for a 5-year period. In approximately one-half of the States the rates are those for the period from 1929 to 1933, inclusive, and the remainder are for the years 1930 to 1934.

In the eastern section of the United States there is a large area of high mortality from tuberculosis for white persons, the high point of which is located in Kentucky and Tennessee. This region has experienced relatively high mortality and the zone immediately surrounding and extending from it, a somewhat lower mortality rate. This intermediate zone surrounding the region in Kentucky and Tennessee has its western limit in eastern Oklahoma and Kansas and extends across northern Arkansas and southern Missouri. Eastward the intermediate zone extends across West Virginia, eastern and northern Virginia, and Maryland. It then sweeps northward along the Atlantic coast across a narrow band of counties from Maryland to Maine, and includes most of the counties along the Hudson River in New York State and the greater part of the New England States. South of the zone of high mortality in Tennessee, the area of moderately high rates includes a considerable number of counties in the northern parts of Mississippi, Alabama, and Georgia, and also a few in the western parts of South Carolina and North Carolina. North of Kentucky the area covers a large number of counties in southern Illinois, Indiana, and Ohio.

The physiographic features of this large area are quite varied. In it are found mountain, foothill, and valley regions and also flat plains. The white population shows wide variations in urban and rural distribution and in other social and environmental conditions. A wide variety of occupations is found in various sections of this extensive area.

Another area in the eastern half of the country which has a relatively higher tuberculosis mortality than the surrounding region, is to be found extending across northern Michigan and Wisconsin and then into Minnesota. This area is less extensive and has had a lower mortality than the large area just described.

[4] Resident rates only for Connecticut, Massachusetts, Minnesota, New York, and Wisconsin.

In the western half of the United States there are a considerable number of counties along the southern border from Texas to California which have experienced an abnormally high mortality from tuberculosis. In Texas the high rates of counties along the Rio Grande are probably due mainly to the fact that deaths classified as white include a considerable number of Spanish-American or Mexican. Since many of them are actually native born, no statistical distinction is made between them and white persons of other national origins. It appears that tuberculosis mortality continues to be higher among these Spanish-Americans than among other white persons.

To a limited extent this same factor is partly responsible for the excessively high rates in some of the counties in Colorado, New Mexico, Arizona, and southern California. However, in most instances the high mortality has been due to the occurrence of many nonresident deaths among those who seek this region for the cure of tuberculosis. This fact is well known and needs little more than mention.

In Nevada, tuberculosis death rates among white persons are excessively high in several counties and moderately high in others. Unlike other regions of the Southwest, there are no sanatoria or other institutions for treatment of tuberculosis located in this area.

There are a large number of counties in the north-central part of California with comparatively high tuberculosis mortality. In some of these counties, particularly those east of the Sacramento Valley, there are a number of tuberculosis sanatoria, most of which are listed as county institutions. Since not all of the counties in the north-central part of the State have sanatoria, some other explanation will have to be found to account for the high mortality which has existed in this region.

In the extreme northwestern part of the country is another area where tuberculosis mortality is higher than for the surrounding territory. This area includes a few counties in northern Oregon, a considerable number in western Washington, and certain groups of counties in Idaho and western Montana. The relatively high rates in some of the counties in this region are due to the fact that deaths occurring in State institutions have not been allocated to the place of usual residence. In a few counties tuberculosis deaths among Indians account for a slightly higher rate. However, these two factors are responsible for the relatively high rates in only a few instances.

There is an area of considerable extent in the western part of the United States which has experienced a very low mortality from tuberculosis, as shown on the accompanying map. This area is coextensive with the area of low mortality in the north central and Great Lakes regions. Another area of low mortality extends southward from North Carolina along the Atlantic and Gulf coasts.

This study shows the advantage of studying the mortality from tuberculosis by some other unit than that of a State. Regions of high and low mortality do not begin or end with the borders of States. From the standpoint of prevention and control of the disease such a study indicates more clearly where efforts need to be concentrated to obtain maximum effects.

No effort has been made in this report to explain the reasons for certain areas of high mortality, except where certain obvious factors are responsible for a high death rate. The vastness of the entire country and the variety of environmental and social conditions found in different regions make it extremely difficult to explain wide differences in tuberculosis mortality. To students of epidemiology this offers a splendid field for study.

RAT HARBORAGE AND RATPROOFING[1]

By B. E. Holsendorf, *Passed Assistant Pharmacist, United States Public Health Service*

The problem of the control of rat life has been an ever-present one, and its solution has claimed the attention of man for many centuries. It is still with us, and no group of persons is more interested in solving it in a satisfactory manner than the public health officials of this and other countries. In the days of the legendary Pied Piper of Hamelin, and in the years that intervened between that time and a generation or two ago, rat control was regarded almost entirely as an economic matter, the concern only of those who suffer loss through the depredation of this animal and annoyance caused by its presence in private homes. Because of the losses sustained and the annoyances caused, the hand of man in all lands has been raised against the rat, and almost every known means has been employed to exterminate this pest.

The interest displayed in rat control by the victims of the rat's depredations was usually of a temporary character and of short duration, and expressed itself in periodic drives, trapping, poisoning campaigns, and similar attacks, which were carried out from time to time. As a general rule, after the immediate danger had been somewhat relieved, such activities were brought to an end, and no further efforts were put forth until conditions again became unbearable.

In earlier times little or nothing was known of the role which the rat and his parasites played in the transmission of certain diseases, especially plague and typhus fever, and the health official was not primarily interested in matters concerning rat control, which was considered, as before stated, purely an economic problem.

[1] Read at the eighth annual meeting of the Florida Public Health Association held at Tampa, Fla., Dec. 7-9, 1936.

However, in the last quarter of a century, as a result of the discoveries of research workers in many countries, this viewpoint has been completely changed. It is now recognized that the control of rats and rodent parasites is a most important public health function, and that it is very much the concern of the health officer, national, State, and local, because the presence of such rodents and their parasites—one a potential reservoir and the other a potential transmitting agent of bubonic plague and typhus fever—constitutes a grave health risk. It is now realized that, in order to reduce this risk to at least the point of safety, rat control must be attained and permanently maintained, for it is permanent control rather than periodic reduction in the number of rats and fleas that will confer the highest degree of health protection.

How can this be accomplished? What practical means can we employ, taking in consideration prevailing conditions, habits, and customs of people, absence of laws or ordinances bearing on the matter, and so forth? It is more or less common knowledge that we still have the rat with us in considerable numbers in practically every community, despite the efforts of people in every part of the world to reduce his population and to control his activities. This, it would appear, is rather conclusive evidence that the problem as yet has not been solved in a satisfactory manner. The reports submitted by delegates to each of the two international conferences on the rat, which were held in Paris in 1928 and 1931, throw some interesting light on this subject and give a mass of information as to the prevalence of rats in the various countries of Europe and their colonies in Asia and Africa.

The various methods of extermination which had been employed, natural enemies, poisons, traps, and similar means, were described in detail. While some remarkable results were reported to have been obtained, the consensus of opinion of the delegates to these conventions was that the results revealed the fact that much remained to be accomplished if permanent rat control was to be obtained. This has also been the experience of public health officials and interested persons in many communities in this country.

There must be some common, fundamental cause for the existence of this universal condition and of the failure to secure efficient permanent rat control. The basic habits of rats are more or less identical, and the eradicative measures which have been employed in various parts of the world coincide very generally with those with which we are familiar; and yet the common experience has been that the results obtained are unsatisfactory. What, then, is the fundamental reason for this failure?

From the experience which has been acquired and the lessons that have been learned during the conduct of many campaigns of rat control and the observation of many of those who have directed or supervised such campaigns, it is believed that the fundamental and basic factor involved is the one of *rat harborage.* Our failure to take serious consideration of the continued existence of the rat in large numbers and to understand and appreciate the important role which this lack of attention plays in providing the rat with the prime biological essential (a fixed habitat) for the propagation of his species is one of the principal reasons for the failures which we have experienced and which have been recorded in the histories of most of the countries of the world.

What is rat harborage, where is it found, and how does it operate to favor continuation of rat life? Rat harborage is the term given to describe the enclosed spaces which afford rats hidden or partly hidden shelter, homes, and suitable facilities for breeding and protection of their young until maturity. There are three general types of rat harborage, namely, (1) structural, (2) incidental, and (3) temporary.

Examples of the first are double walls, space between floors and ceilings, hollow-tile partitions, enclosed stairways, hollow boxed molding, raised platforms, and similar protected places.

Those of the second may be cited as furniture and equipment, things that are incidental to the use that is made of a building or its subdivisions and are installed therein.

Examples of temporary harborage are mass storage of material or merchandise, rubbish heaps, old furniture, odds and ends piled in cellars, attics, and closets, and similar accumulations which, if left undisturbed for periods of several weeks, can and will be used by rats for homes and breeding places.

Rat harborage is to be found in the great majority of the buildings of the older type, and also in some buildings of modern construction, and in a great many styles of furniture and equipment which are installed in mercantile and manufacturing establishments. Surveys which have been conducted in a number of cities and towns in different regions of the country have revealed some interesting facts as to the existence of rat harborage of the three general types just described. Photographic records have been made of a few of them so that each type of harborage and the surrounding conditions may be analyzed and studied.

In the majority of instances rat harborage exists because little or no consideration has been given by the owners, the architects, the builders, or the authorities to the desirability or necessity of providing for its elimination at the time the building was designed, planned, and constructed. As a result, man has provided and continues to provide rats with enclosed spaces ideally adapted for homemaking; and the

same may be said of certain types of fixtures and equipment. In other words, man himself thoughtlessly establishes rat sanctuaries and gives the matter no further thought until the rodents become so plentiful that they must be killed off or reduced in numbers.

An article which has a direct bearing on this phase of the subject appeared in Pencil Points for September 1934, under the title of "A Half Century of Architecture." The subject of this biographical review, a most outstanding New York architect, now deceased, had related this story to his friend who had written the article: Two wealthy ladies had built houses in Newport at different times, in a part of the town where shore rats were a considerable nuisance. One of the ladies had lived in her house for a couple of years and was calling for the first time on the newcomer, whose house had recently been completed. The older resident asked her neighbor how she liked her new house, to which the latter replied that she was very much pleased with it, but was troubled a great deal with rats. "Who was your architect?" asked the visitor. "Mr. Blank", the hostess replied. Hitching her chair forward and shaking an indignant forefinger the visitor said in a voice of concentrated venom, "Don't you know we had the same trouble with that man!"

The distinguished architect regarded this as a great joke on himself, and delighted in telling it to his friends. The coincidence of rat infestation in two expensively constructed houses designed by him and built under his supervision and direction did not suggest to him that architectural faults might be the cause but merely gave him grounds for merriment and jesting. Had there been a coincidence of leaks around the chimney structure or in or around the window frames, an investigation to find the cause would have been conducted and steps would have been taken to remove it. Public health officials must not be content until they have persuaded the architect and builder to change their point of view and give serious consideration to the matter of designing and building structures that are fundamentally free from rat harborages.

Rat harborage is not only responsible for the persistence of rat infestation of buildings and ships, but its existence is one of the chief causes of the high flea index found on rats.

Surg. C. R. Eskey, of the United States Public Health Service, in articles published in Public Health Reports for September 5, 1930, and November 18, 1932, entitled, "Epidemiological Studies and Aspects of Bubonic Plague in Ecuador and Peru", has the following to say concerning rat harborage and its relation to the flea index and the possibility of transmission of plague: "Buildings (in Ecuador) offering the greatest rat harborage within them have the highest *cheopis* index," which Eskey found to be 7.37 for 45 class B buildings, 8.79 for 62 class C buildings, and 5.24 for 71 class D buildings. He also

observed that "the *cheopis* index will be proportional to the number of rats when the rats are harboring inside buildings which offer suitable places for flea reproduction."

On the basis of his findings in Peru a year later, Surgeon Eskey stated:

> The *cheopis* index was greater for rats caught in buildings. The greatest incidence of plague per thousand population in towns and cities in Peru occurred in the communities in which the rat harborage of buildings was greatest, regardless of the climatic location of the towns within or outside the zone most favorable to the existence of the chief transmitting agent, *X. cheopis.*

On the other hand, Eskey discovered in Ecuador that "rats harboring *outside* of buildings in Guayaquil have a *cheopis* index too small to cause an epidemic of plague among them", and he makes this significant statement in his summary:

> It is doubtful whether the low incidence or even complete absence of human plague due to relative rat-proof construction of buildings could be better illustrated than by the findings in central and southern Peru. It is desired to emphasize that in most parts of the world where *X. cheopis* is the transmitting agent, plague could never exist in epidemic form if the buildings were so constructed and maintained that the rat population within them was reduced to a minimum.

In Research now in Progress in Hawaii, published in the Pan-Pacific Research Institution, July 1933, Surgeon Eskey has this to say:

> The *cheopis* [flea] was found to be most abundant on rats caught in or under buildings * * *. Rats caught over three or four hundred feet away from buildings were practically free from this flea. In other words, the *cheopis* is a house flea. In this regard, I might mention that the ratproofing of buildings not only keeps out rodents, but will also reduce the number of plague-spreading fleas in a community. An example of such a reduction in the house plague-fleas due to reduced rat harborage in buildings was observed in the data collected from the Mahakua district, where the index of these fleas was much lower than in any other part of the island.

Since the research work of Maxcy, Dyer, Rumreich, and Badger has shown that the reservoir of infection of endemic typhus is in the rat, and that the transmission of this infection is by the rat flea, the observation of Eskey of the relation of rat harborage to the rat-flea index, and our own knowledge of the existence in practically all of our communities of the three types of rat harborage described above, which is largely responsible for the continued presence of both the rat and the high flea index, the elimination of such harborage becomes a paramount necessity if the spread of endemic typus fever is to be permanently controlled and its existence eventually wiped out. And this brings us to the consideration of the second subject mentioned in the title of this paper, namely, "Ratproofing."

What is ratproofing, scientifically and technically?

Scientifically, ratproofing is the process of applying methods that are the very opposite of those employed for game preservation.

Instead of giving or restoring to a species a home equipped with the facilities for breeding and protecting the young until maturity, the process is reversed; these facilities are removed, and every effort is made to deprive the rat of the use of them.

Technically, it is applying these four fundamental rules in the construction and upkeep of building structures and their equipment:

1. Employ an approved ratproof design that fundamentally eliminates unnecessary enclosed spaces.
2. Use material of a ratproof character.
3. Employ approved ratproof methods of construction and installation.
4. Provide for periodic inspection of buildings and equipment to insure permanent upkeep.

Types of design that are free from harborages, the classes of material that are inherently impervious to rat gnawing, and approved methods of ratproof construction and installation are given in several publications issued by the Public Health Service and the Department of Agriculture, and they will not be discussed in detail in this paper. Neither will time permit a discussion of the methods which have been suggested for the corrective ratproofing of existing buildings which are actually rat infested. To some extent, suggestions for accomplishing this have been embodied in survey reports, drawings, and various pamphlets which have been placed in the hands of several State health officers by the Public Health Service. Publications dealing with the various phases of this problem are being revised by the Public Health Service and will be available for distribution in the near future.

The launching of a campaign of this character—that is, "building out the rat"—is an undertaking which involves careful planning and training of personnel. The successful outcome depends on the support and cooperation given to the State and local health officers by the people of each community.

As long as the people remain passive and manifest little or no interest in this matter, no real progress in rat control is possible. It is the public who provide the rat with a secure home and food. Therefore, the public should be made conscious of this fact, and of the manner in which they could effectively cooperate to bring about the desired change.

This can be best accomplished through education, which should be practical and concrete, and should be brought to the very doorstep of the property owner or tenant of the building concerned. The various types of rat harborage must be demonstrated, and the practical methods of eliminating or correcting them must be explained and illustrated.

In addition to the education of the general public as just mentioned, and through the public schools, colleges, universities, civic, and other organizations, this permanent campaign must include the dissemination of information on the subject to architects, builders, contractors, plumbers, electricians, and others of the building trades to the end that they will have a better understanding of the problems involved, know what to do and how to do it, and thus be prepared to lend effective cooperation. No satisfactory progress can be made until these agencies give the health officer their support and cooperation. We must not only teach the property owner the necessity and desirability of having ratproof buildings and equipment, and to demand them, but we must invite, urge, and assist the people who design, construct, and equip buildings to be prepared to meet such a demand.

To carry out such an educational program will require careful and painstaking work, but it will be well worth the effort, for it will lay a solid foundation of understanding of the various phases of the problem, inspire public confidence, and result in more whole-hearted cooperation and support.

Legislation vital to the success of obtaining and maintaining permanent rat control can be more easily secured when the majority of the representative people have been trained by education and personal experience, or both, to recognize the need and wisdom of such action and to understand and appreciate the benefits and health protection which it will confer.

The special training which sanitary officers and others concerned should undergo in order to fit them for this important work has been outlined, as well as the type and character of the equipment with which they should be provided; the details will not be discussed here.

In conclusion, I would like to state that we would not delude you or ourselves with the idea that perfection has been attained, and that by waving of the magic wand of ratproofing all the rats in the world can be made to disappear as in the legendary story of the Pied Piper of Hamelin. It is felt, however, that as a result of the knowledge and experience on this subject which have been acquired, we have been able to outline a plan of campaign for rat control which is based on sound scientific principles, as well as a fair knowledge of rat psychology and habits.

The success of the campaign will depend largely upon how well the groups mentioned can be prevailed upon to cooperate and give the health officer continuous support. If all concerned will be as alert, resourceful, determined, and as tireless in their efforts to build out the rat and keep him out as we have found the rat to be to prevent his species from becoming extinct, permanent success is assured.

PURE FOOD REGULATIONS OF MEXICO

Under date of August 21, 1936, the first pure-food regulations of Mexico were promulgated by the Department of Public Health, which is given authority over such products by the Sanitary Code of December 20, 1935.

The regulations apply to both foodstuffs and beverages, including all "articles that are to be introduced into the digestive tract, with the exception of those used for therapeutic purposes", and require that all such articles intended for public consumption, in containers or sealed packages, "shall be registered in the Department of Public Health in order that the latter may authorize their manufacture, warehousing, transportation, possession, importation, elaboration, sale, or the furnishing thereof to the public." Foodstuffs that are claimed to have a therapeutic value must be registered as medicinal products. In the case of imported foodstuffs or beverages, there must be added to the application for registry a certification regarding the authorization of sale and consumption of such products in the country of origin. Certain information and a sample of the product are required to be submitted with the application for registry.

Tags, labels, notices, and commercial advertising of both domestic and foreign foodstuffs and beverages presented for registry, as well as the legends of the containers and packages, must be in Spanish, which can be repeated in other languages if desired. In addition, detailed requirements are specified regarding the form of tags and labels, especially those on adulterated products.

The Department of Public Health is to publish in the "Diario Oficial" the commercial names of foodstuffs and beverages that have been accepted for registry, as well as the lists of those rejected; and steps will be taken by the proper officials to prevent the entry into Mexico of products that have not been approved by the Department of Public Health.

The Department of Public Health will, periodically, ascertain whether approved products maintain the quality and conditions under which they were approved. Neither the products nor legends, etc., may be changed without previous approval of the Department of Public Health. The use of the name of the Department of Public Health, the names of the sanitary authorities, and the quoting in full or in part of the resolutions or decisions of the Department issued in connection with the registry of a product are prohibited in any publicity or commercial statements regarding the product, merely the form "Accepted D. S. P.", and the registry number being permitted.

DEATHS DURING WEEK ENDED DEC. 26, 1936

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 26, 1936	Corresponding week, 1935
Data from 86 large cities of the United States:		
Total deaths	8,548	9,044
Deaths per 1,000 population, annual basis	11.9	12.6
Deaths under 1 year of age	530	510
Deaths under 1 year of age per 1,000 estimated live births	48	47
Deaths per 1,000 population, annual basis, 52 weeks of year	12.0	11.4
Data from industrial insurance companies:		
Policies in force	68,974,371	67,841,506
Number of death claims	10,869	10,593
Death claims per 1,000 policies in force, annual rate	8.2	8.1
Death claims per 1,000 policies, 52 weeks of year, annual rate	9.7	9.5

112915°—37——2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 2, 1937, and Jan. 4, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 2, 1937, and Jan. 4, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936
New England States:								
Maine	-------	5	3	1	8	181	0	0
New Hampshire	-------	-------	-------	-------	1	2	0	0
Vermont	-------	-------	-------	-------	-------	203	0	0
Massachusetts	5	13	-------	-------	654	241	2	1
Rhode Island	1	-------	-------	-------	45	135	0	1
Connecticut	1	1	18	31	157	93	1	2
Middle Atlantic States:								
New York	28	42	[1] 487	[1] 21	220	543	6	12
New Jersey	13	14	26	9	278	12	4	3
Pennsylvania	50	68	-------	-------	59	283	5	3
East North Central States:								
Ohio	56	51	48	8	24	79	8	2
Indiana	21	40	322	40	5	4	1	3
Illinois	59	67	455	20	22	36	9	9
Michigan	41	20	12	3	41	22	2	3
Wisconsin	7	2	164	44	23	63	0	2
West North Central States:								
Minnesota	6	5	7	-------	21	66	0	0
Iowa	2	11	45	1	4	5	1	6
Missouri	23	27	189	150	8	13	2	5
North Dakota	-------	2	-------	2	3	2	0	0
South Dakota	-------	-------	9	-------	3	4	0	0
Nebraska	2	5	-------	-------	2	43	2	0
Kansas	10	13	13	7	4	7	0	0
South Atlantic States:								
Delaware	2	1	2	-------	82	85	0	1
Maryland [2] [3]	9	7	25	37	164	72	1	8
District of Columbia	5	18	3	4	11	5	2	2
Virginia	25	25	-------	-------	67	16	13	4
West Virginia	13	14	64	139	9	1	6	3
North Carolina [3]	61	22	46	16	38	3	5	4
South Carolina [3]	3	1	400	239	13	1	0	1
Georgia [3]	17	10	77	135	-------	-------	0	3
Florida	11	13	4	5	1	1	12	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 2, 1937, and Jan. 4, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936
East South Central States:								
Kentucky	15	19	57	13	9	46	32	7
Tennessee	25	17	108	81	31	6	5	9
Alabama [3]	19	18	121	213	2	19	7	3
Mississippi [2]	7	12					0	2
West South Central States:								
Arkansas	5	19	46	87		5	0	2
Louisiana	15	10	23	20	14	21	1	1
Oklahoma [4]	3	16	72	77	3	4	4	7
Texas [3]	55	21	362	155	127	2	5	3
Mountain States:								
Montana	3	1	282	41	3	17	0	1
Idaho	2	4	30		89	11	3	0
Wyoming		2	300		3	2	2	2
Colorado	5	9			7	5	2	3
New Mexico	4	1	15	2	1		0	1
Arizona		10	65	91	50	3	0	0
Utah [2]					80	1	1	0
Pacific States:								
Washington	5	1	2		17	79	0	1
Oregon		3	47	32	6	345	0	2
California	58	40	44	62	42	422	5	8
Total	692	700	3,993	1,786	2,451	3,209	149	130
53 weeks	29,171	38,734	161,816	120,202	287,242	725,081	7,541	5,721

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936
New England States:								
Maine	0	1	11	19	0	0	0	0
New Hampshire	0	0	17	13	0	0	0	0
Vermont	0	0	3	11	0	0	0	0
Massachusetts	0	1	176	234	0	0	0	2
Rhode Island	0	0	37	25	0	0	0	0
Connecticut	0	0	51	40	0	0	2	2
Middle Atlantic States:								
New York	0	4	610	620	35	0	4	4
New Jersey	1	2	1[illegible]5	121	0	0	2	0
Pennsylvania	0	0	5[illegible]0	528	0	0	11	9
East North Central States:								
Ohio	4	0	380	378	8	1	5	2
Indiana	0	1	194	273	7	7	2	0
Illinois	4	0	437	521	2	5	12	4
Michigan	1	1	520	194	0	0	11	1
Wisconsin	0	0	228	417	12	16	1	0
West North Central States:								
Minnesota	0	0	111	320	12	2	1	2
Iowa	0	3	84	113	12	1	3	0
Missouri	3	0	174	148	41	7	6	0
North Dakota	0	0	65	33	21	2	0	1
South Dakota	0	0	33	52	0	5	0	1
Nebraska	0	0	43	151	1	23	2	0
Kansas	2	1	270	143	21	11	1	0
South Atlantic States:								
Delaware	0	0	12	12	0	0	0	1
Maryland [2] [3]	0	0	68	64	0	0	3	2
District of Columbia	0	0	15	18	0	0	0	1
Virginia	1	0	38	45	0	0	7	12
West Virginia	1	0	41	64	0	0	5	0
North Carolina [3]	0	0	56	29	0	1	4	2
South Carolina [3]	1	0	5	12	0	0	1	2
Georgia [3]	1	0	13	15	0	0	2	4
Florida	2	0	12	12	0	0	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 2, 1937, and Jan. 4, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936	Week ended Jan. 2, 1937	Week ended Jan. 4, 1936
East South Central States:								
Kentucky	1	1	49	57	0	0	1	5
Tennessee	0	0	44	42	0	0	2	3
Alabama [3]	1	0	19	11	0	0	5	1
Mississippi [2]	2	0	19	17	0	0	2	0
West South Central States:								
Arkansas	1	0	4	33	0	0	3	9
Louisiana	0	0	14	15	0	0	12	7
Oklahoma [4]	0	1	16	33	4	0	4	1
Texas [3]	1	0	75	51	0	3	11	0
Mountain States:								
Montana	0	0	71	193	24	34	2	0
Idaho	0	0	19	33	17	0	3	0
Wyoming	0	0	28	229	1	4	0	0
Colorado	1	0	25	141	1	31	1	1
New Mexico	0	0	24	53	0	0	5	9
Arizona	0	0	7	15	0	0	0	0
Utah [2]	0	0	19	80	0	0	0	0
Pacific States:								
Washington	1	0	36	78	5	6	1	2
Oregon	0	0	44	51	22	0	0	1
California	4	5	215	284	5	4	14	8
Total	33	21	5,087	6,041	251	163	151	99
53 weeks	4,526	10,753	239,031	257,624	7,710	7,653	14,760	17,590

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 2, 1937, 25 cases, as follows: Maryland, 1; North Carolina 3; South Carolina, 2; Georgia, 14; Alabama, 3; Texas, 2.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1936										
Missouri	6	42	98	244	10	1	9	111	6	147
September 1936										
Missouri	7	43	109	192	5		19	101	2	143
Puerto Rico		58	43	1,834	100	1	2		0	75
October 1936										
Arizona	4	25	150	6	58	1		46	0	15
Missouri	5	114	442	87	15		35	323	3	151
November 1936										
Arizona		21	222	5	135	1	6	77	0	10

Summary of monthly reports from States—Continued

August 1936

	Cases
Missouri:	
Chicken pox	20
Dysentery	125
Mumps	33
Ophthalmia neonatorum	1
Rabies in animals	12
Septic sore throat	40
Trachoma	61
Undulant fever	2
Whooping cough	84

September 1936

	Cases
Chicken pox:	
Missouri	6
Puerto Rico	3
Dysentery:	
Missouri	116
Puerto Rico	51
Filariasis:	
Puerto Rico	5
Mumps:	
Missouri	17
Puerto Rico	8
Ophthalmia neonatorum:	
Missouri	1
Puerto Rico	3
Puerperal septicemia:	
Puerto Rico	9
Rabies in animals:	
Missouri	12
Septic sore throat:	
Missouri	27

September 1936—Continued

	Cases
Tetanus:	
Missouri	3
Puerto Rico	5
Tetanus, infantile:	
Puerto Rico	1
Trachoma:	
Missouri	63
Tularaemia:	
Missouri	1
Undulant fever:	
Missouri	7
Whooping cough:	
Missouri	81
Puerto Rico	38

October 1936

	Cases
Chicken pox:	
Arizona	33
Missouri	70
Dysentery:	
Arizona	31
Missouri	135
Encephalitis, epidemic or lethargic:	
Arizona	1
Missouri	3
German measles:	
Arizona	8
Mumps:	
Arizona	45
Missouri	22

October 1936—Continued

	Cases
Ophthalmia neonatorum:	
Missouri	1
Rabies in animals:	
Missouri	14
Septic sore throat:	
Missouri	29
Tetanus:	
Missouri	1
Trachoma:	
Arizona	22
Missouri	87
Tularaemia:	
Missouri	3
Undulant fever:	
Arizona	1
Missouri	4
Whooping cough:	
Arizona	12
Missouri	113

November 1936

	Cases
Arizona:	
Chicken pox	43
Dysentery	30
Encephalitis, epidemic or lethargic	1
German measles	9
Mumps	19
Trachoma	31
Tularaemia	1
Whooping cough	3

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 26, 1936

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	6	1	0	0	0	2	21
New Hampshire:											
Concord	0		0	1	2	1	0	0	0	0	10
Manchester	0		0	2	4	0	0	0	0	0	21
Nashua	0			0		0	0		0	0	
Vermont:											
Barre											
Burlington	1		0	0	0	1	0	0	0	0	9
Rutland	0		0	0	2	0	0	0	0	1	9
Massachusetts:											
Boston	2		3	6	28	47	0	14	0	111	237
Fall River	0		0	0	2	1	0	2	0	3	27
Springfield	0		0	7	3	4	0	0	0	11	35
Worcester	0		0	38	13	3	0	1	0	8	63
Rhode Island:											
Pawtucket	0		0	0	0	1	0	0	0	0	16
Providence	0		0	18	11	12	0	3	0	2	58
Connecticut:											
Bridgeport	0		1	23	5	2	0	1	1	3	37
Hartford	1		0	0	1	5	0	0	0	5	
New Haven	0	2	0	0	2	2	0	0	0	3	37
New York:											
Buffalo	10		1	41	0	24	0	5	0	13	141
New York	21	36	12	33	162	140	0	87	1	42	1,463
Rochester	0		1	1	10	4	0	1	0	12	68
Syracuse	0			18	3	7	0	1	0	20	38
New Jersey:											
Camden	5		0	0	2	3	0	0	0	2	28
Newark	0		0	72	9	10	0	11	0	19	89
Trenton	0		0	0	6	3	0	2	0	3	28

City reports for week ended Dec. 26, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Pennsylvania:											
Philadelphia	3	4	4	7	33	94	0	19	1	62	466
Pittsburgh	6	------	2	1	29	42	0	8	0	16	154
Reading	0	------	0	1	3	6	0	2	0	23	36
Scranton	0	------	------	0	------	2	0	------	0	0	------
Ohio:											
Cincinnati	3	------	1	0	26	13	0	3	0	2	151
Cleveland	4	7	4	0	26	46	0	12	2	32	201
Columbus	0	3	3	0	9	12	0	2	0	4	91
Toledo	0	1	0	2	5	5	0	8	0	5	56
Indiana:											
Anderson	0	------	0	0	4	12	0	0	0	2	16
Fort Wayne	1	------	0	0	2	2	0	0	0	0	22
Indianapolis	0	------	1	2	13	15	0	5	0	0	89
Muncie	0	------	0	0	4	1	0	0	0	1	12
South Bend	0	------	0	0	3	0	0	1	0	0	19
Terre Haute	2	------	0	0	0	0	0	0	0	0	26
Illinois:											
Alton	0	------	0	0	1	1	0	0	0	0	7
Chicago	6	161	32	4	126	168	0	48	0	56	962
Elgin	0	------	0	0	0	0	0	0	0	9	6
Moline	0	------	0	0	1	0	0	0	0	2	13
Springfield	------	------	------	------	------	------	------	------	------	------	------
Michigan:											
Detroit	14	12	2	6	24	137	0	17	7	59	274
Flint	0	------	0	0	5	6	0	1	0	0	35
Grand Rapids	0	------	1	2	2	6	0	0	2	18	41
Wisconsin:											
Kenosha	1	------	0	0	0	2	0	0	0	0	5
Madison	0	------	0	1	1	5	0	1	0	1	18
Milwaukee	2	1	0	5	10	36	0	4	0	30	117
Racine	0	------	0	0	0	6	0	0	0	1	15
Superior	0	------	0	0	0	2	0	0	0	1	5
Minnesota:											
Duluth	0	------	0	1	1	21	0	1	1	2	16
Minneapolis	3	------	1	1	4	9	0	0	1	3	93
St. Paul	0	2	2	1	8	8	0	1	0	12	72
Iowa:											
Cedar Rapids	0	------	------	0	------	2	0	------	0	1	------
Des Moines	0	------	------	0	------	14	0	------	0	0	29
Sioux City	1	------	------	0	------	9	2	------	0	0	------
Waterloo	0	------	------	1	------	1	0	------	0	2	------
Missouri:											
Kansas City	2	1	0	1	11	24	0	3	0	6	103
St. Joseph	0	------	0	0	7	4	8	0	0	0	24
St. Louis	4	------	0	0	16	19	0	2	2	53	218
North Dakota:											
Fargo	0	------	0	0	1	0	0	1	0	0	11
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	1	0	0	5
South Dakota:											
Aberdeen	0	------	------	0	------	0	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	6
Nebraska:											
Omaha	1	------	2	1	11	6	0	0	0	0	63
Kansas:											
Lawrence	0	------	0	0	1	0	0	0	1	0	2
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	2	------	0	2	5	5	0	1	0	2	33
Delaware:											
Wilmington	1	------	0	50	3	0	0	1	0	0	22
Maryland:											
Baltimore	5	4	3	66	28	23	0	7	1	72	218
Cumberland	0	------	0	0	3	1	0	0	1	0	21
Frederick	0	------	0	0	0	0	0	0	0	1	5
District of Col.:											
Washington	5	2	2	5	25	12	0	9	1	6	163
Virginia:											
Lynchburg	1	------	1	0	2	0	0	0	0	0	16
Norfolk	0	------	0	0	1	4	0	0	0	1	17
Richmond	0	------	2	0	13	5	0	4	0	4	65
Roanoke	0	------	0	0	10	1	0	0	0	2	23
West Virginia:											
Charleston	0	------	0	0	8	0	0	3	0	0	47
Huntington	0	------	------	0	------	3	0	------	0	0	------
Wheeling	0	------	0	0	2	0	0	0	0	0	15

City reports for week ended Dec. 26, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Gastonia	1			1		0	0		0	0	
Raleigh	0		0	0	1	0	0	0	0	0	18
Wilmington	0		0	0	3	0	0	0	0	1	13
Winston-Salem	1	1	0	0	2	2	0	0	0	0	10
South Carolina:											
Charleston	4	15	0	0	2	7	0	0	0	1	17
Columbia											
Florence	0		0	0	2	0	0	0	0	0	8
Greenville	1		0	0	0	1	0	0	0	0	2
Georgia:											
Atlanta	1	9	2	0	12	7	0	5	0	0	94
Brunswick	0		0	0	0	0	0	1	0	0	4
Savannah	2	20	1	0	2	1	0	1	0	1	30
Florida:											
Miami	0		0	0	2	0	0	0	0	0	29
Tampa	0	1	1	0	1	0	0	4	0	1	26
Kentucky:											
Ashland											
Covington	0		0	0	1	1	0	1	0	1	22
Lexington	1		0	14	2	1	0	2	0	0	25
Tennessee:											
Knoxville	1	2	2	0	3	1	0	2	0	0	18
Memphis	0		1	0	11	4	0	3	0	3	63
Nashville	2		0	0	2	2	0	2	0	3	28
Alabama:											
Birmingham	1		3	0	7	4	0	0	0	0	61
Mobile	0	1	0	0	2	0	0	1	0	0	26
Montgomery	2			0		1	1		0	0	
Arkansas:											
Fort Smith	0			0		2	0		0	0	
Little Rock											
Louisiana:											
Lake Charles	0		0	0	0	0	0	0	0	0	4
New Orleans	7	2	2	0	17	5	0	12	1	0	187
Shreveport	0		0	0	5	1	0	1	0	0	44
Oklahoma:											
Tulsa	1			0		5	0		0	0	
Texas:											
Dallas	1	2	2	3	9	14	0	2	1	2	61
Fort Worth	1		0	29	9	2	0	3	0	0	34
Galveston	0		0	0	2	0	0	0	0	0	24
Houston	2		0	0	5	1	0	3	1	0	54
San Antonio	3		4	0	5	0	0	6	0	0	59
Montana:											
Billings	0	1	0	0	4	1	0	0	0	0	12
Great Falls	0		0	1	4	2	1	0	0	1	11
Helena	0	1	1	0	0	1	0	0	0	1	4
Missoula	0		0	0	2	0	0	0	0	0	6
Idaho:											
Boise	0		0	0	3	1	0	0	0	0	9
Colorado:											
Colorado Springs	0		0	0	2	2	0	1	0	0	19
Denver	4		2	4	13	6	0	6	0	45	74
Pueblo	1		0	0	1	3	0	0	0	0	11
New Mexico:											
Albuquerque	0		0	1	4	2	0	3	0	0	28
Utah:											
Salt Lake City	0		1	3	2	7	0	1	0	0	37
Nevada:											
Reno											
Washington:											
Seattle	0		1	4	9	4	0	8	0	3	109
Spokane	0		0	2	9	6	1	0	0	0	34
Tacoma	0		0	0	1	3	0	0	0	0	11
Oregon:											
Portland	0	2	1	1	14	3	0	1	0	7	79
Salem	0			0		0	0		0	0	
California:											
Los Angeles	10	16	1	5	25	26	0	12	2	48	349
Sacramento	1		1	0	4	18	0	1	0	1	28
San Francisco	2		2	2	12	10	0	3	1	6	186

City reports for week ended Dec. 26, 1936—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Iowa:			
Boston	1	0	0	Des Moines	1	0	0
New York:				Missouri:			
New York	3	1	0	St. Louis	1	0	0
Rochester	1	0	0	District of Columbia:			
Pennsylvania:				Washington	2	3	0
Philadelphia	1	0	0	West Virginia:			
Pittsburgh	3	0	0	Wheeling	1	0	0
Ohio:				Georgia:			
Cincinnati	2	0	0	Atlanta	1	1	0
Cleveland	2	0	1	Tennessee:			
Indiana:				Memphis	3	0	0
Anderson	1	0	0	Louisiana:			
Indianapolis	1	0	0	New Orleans	1	1	0
South Bend	0	1	0	Shreveport	0	1	0
Illinois:				Texas:			
Chicago	2	1	0	Dallas	1	1	0
Michigan:				Houston	1	0	0
Detroit	1	0	1	Oregon:			
Flint	0	0	1	Portland	0	1	0
Minnesota:				California:			
Minneapolis	2	2	0	Los Angeles	0	1	0

Encephalitis, epidemic or lethargic.—Cases: Baltimore, 1, Birmingham, 1.
Pellagra.—Cases: Charleston, S. C., 1; Atlanta, 2; Savannah, 2; Dallas, 3.
Typhus fever.—Cases: Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 12, 1936.—During the 2 weeks ended December 12, 1936, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	--------	--------	1	1	3	1	--------	--------	--------	6
Chicken pox	--------	14	3	678	1,037	120	256	83	300	2,441
Diphtheria	--------	10	2	53	11	9	3	5	5	103
Dysentery	--------	--------	--------	--------	3	--------	--------	--------	--------	3
Erysipelas	--------	1	--------	8	11	4	3	2	7	36
Influenza	--------	20	--------	--------	17	2	4	--------	11	54
Lethargic encephalitis	--------	--------	--------	--------	--------	--------	--------	--------	2	2
Measles	--------	3	18	525	486	117	1,022	214	1,233	3,618
Mumps	--------	--------	150	--------	319	28	26	68	140	731
Paratyphoid fever	--------	--------	--------	--------	1	--------	--------	--------	--------	1
Pneumonia	1	3	--------	--------	31	--------	7	--------	19	61
Poliomyelitis	--------	--------	--------	--------	--------	24	2	1	1	28
Scarlet fever	--------	23	10	185	205	132	47	182	62	906
Smallpox	--------	--------	--------	--------	--------	--------	--------	4	--------	4
Trachoma	--------	--------	--------	--------	68	--------	1	--------	8	77
Tuberculosis	6	11	27	104	93	15	23	5	22	305
Typhoid fever	--------	1	3	30	4	1	9	--------	13	61
Whooping cough	--------	139	2	316	251	12	82	8	20	830

CZECHOSLOVAKIA

Communicable diseases—October 1936.—During the month of October 1936, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2	1	Paratyphoid fever	38	2
Cerebrospinal meningitis	7	5	Poliomyelitis	23	4
Chicken pox	276	--------	Puerperal fever	35	16
Diphtheria	3,063	178	Scarlet fever	3,278	51
Dysentery	100	20	Trachoma	62	--------
Influenza	47	6	Typhoid fever	891	65
Malaria	85	--------			

GREAT BRITAIN

England and Wales—Infectious diseases—13 weeks ended September 26, 1936.—During the 13 weeks ended September 26, 1936, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Diphtheria	11,868	Puerperal pyrexia	1,540
Ophthalmia neonatorum	1,174	Scarlet fever	20,112
Pneumonia	5,342	Typhoid fever	1,488
Puerperal fever	443		

England and Wales—Vital statistics—Third quarter 1936.—During the quarter ended September 30, 1936, 155,746 live births and 99,941 deaths were registered in England and Wales. The following vital statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, quarter ended Sept. 30, 1936

Annual rates per 1,000 population:	
Live births	15.2
Stillbirths	.59
Deaths, all causes	9.8
Deaths under 1 year of age	[1] 43
Deaths from:	
Diarrhea and enteritis (under 2 years of age) [1]	5.5
Diphtheria	.06
Annual rates per 1,000 population—Continued	
Deaths from:	
Influenza	0.04
Measles	.02
Scarlet fever	.01
Typhoid fever and paratyphoid fever	.01
Violence	.51
Whooping cough	.04

[1] Per 1,000 live births.

JAMAICA

Communicable diseases—4 weeks ended December 26, 1936.—During the 4 weeks ended December 26, 1936, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	1	8	Puerperal fever	1	
Diphtheria	3		Scarlet fever		2
Dysentery	10	4	Tuberculosis	31	78
Leprosy		3	Typhoid fever	8	29

YUGOSLAVIA

Communicable diseases—November 1936.—During the month of November 1936 certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	42	6	Poliomyelitis	11	2
Cerebrospinal meningitis	12	4	Scarlet fever	754	7
Diphtheria and croup	1,331	108	Sepsis	11	4
Dysentery	21	6	Tetanus	28	12
Erysipelas	379	10	Typhoid fever	466	46
Measles	1,071	2	Typhus fever	7	
Paratyphoid fever	21	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for December 25, 1936, pages 1803-1815. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued January 29, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India—Negapatam.—During the week ended December 26, 1936, 11 cases of cholera were reported in Negapatam, India.

Siam—Bangkok.—During the week ended December 26, 1936, 2 cases of cholera with 2 deaths were reported in Bangkok, Siam.

Plague

Argentina.—During the first half of December 1936, plague was reported in Argentina as follows: Cordoba, Cordoba Province, 5 cases; San Luis, San Luis Province, 1 case, 1 death.

Hawaii Territory—Island of Hawaii—Hamakua District.—On December 31, 1936, 1 rat found in Kukaiau, and 2 rats found in Paauhau, all in Hamakua District, Island of Hawaii, Hawaii Territory, have been proved plague-infected.

Typhus Fever

Egypt—Port Said.—During the week ended December 26, 1936, 1 case of typhus fever with 1 death was reported in Port Said, Egypt.

Eritrea—Asmara.—During the period December 1–15, 1936, 2 cases of typhus fever were reported in Asmara, Eritrea.

Sierra Leone—Freetown.—During the week ended November 7, 1936, 1 case of typhus fever was reported in Freetown, Sierra Leone.

Yellow Fever

Colombia.—Yellow fever has been reported in Colombia as follows: During the period November 29–December 19, 1936, 3 cases of yellow fever with 1 death were reported in Colombia, no other location being given. In Intendencia of Meta, Colombia, yellow fever was reported as follows: October 24, 1936, 1 case in Quenane; October 31, 1936, 1 case in Restrepo; November 23, 1936, 1 case with 1 death in Villavicencio.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878, under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

VOL. 52 JANUARY 22, 1937 NO. 4

RECENT EXTENSION OF VENEREAL DISEASE CONTROL WORK THROUGH THE PROVISIONS OF THE SOCIAL SECURITY ACT[1]

By R. A. VONDERLEHR, *Assistant Surgeon General, United States Public Health Service*

A few months ago we requested the health officers of the several States to inform us concerning the venereal disease control measures which were being developed in their health departments on October 1, 1936, under the provisions of the Social Security Act. Similar information had been collected in 1935 before social security appropriations were made available,[2] and this furnished a basis for comparison. The data upon which the present report is based consist, therefore, of statements submitted by the several State health officers. Generally speaking, it is felt that a clear description is given of the newly applied measures in the several States.

Eleven States (Alabama, Arizona, California, Florida, Indiana, Michigan, Nebraska, Nevada, New Hampshire, New Mexico, and Wyoming) reported that no funds had been allotted for the control of the venereal diseases. Several States had planned comprehensive programs but had not adopted them on October 1. If adopted, the projected work will lead undoubtedly to splendid accomplishments. Only work that appeared to be actually under way as of the above date, however, has been included in the present report. Detailed measures established by individual States will first be described. This will be followed by a presentation of the progress made by all States in instituting a generally accepted means of combating the venereal diseases.

DETAILED MEASURES ESTABLISHED BY STATES

Connecticut.—The cities of New Haven and New Britain have been allotted $1,800 each, the greater part of which is for salaries of part-time physicians in the venereal disease clinics. The State department of health has budgeted $3,000 for the purchase of antisyphilitic drugs.

Delaware.—In two towns night clinics have been opened in addition to the regular weekly clinics. In Wilmington a social service

[1] Read at the Conference on Venereal Disease Control Work, Washington, D. C., Dec. 28, 1936.

[2] Venereal disease control programs of the State departments of health. Ven. Dis. Inform., 17. 177 (1936).

nurse has been assigned to work with the four hospitals which maintain clinics. Arsenicals and other materials are furnished free to these clinics and some equipment has been given to one. The clinic directors are paid a small fee for attendance. A nurse has been added to each county unit to do follow-up work in tuberculosis and venereal diseases and to assist in the clinics. More thorough investigations are made as to the sources of infection, and isolation has been resorted to in several instances.

Mailing kits for delayed dark-field examinations have been made available to physicians. New pamphlets on syphilis and gonorrhea have been prepared for physicians to give to patients, and for distribution in the clinics.

District of Columbia.—New activities have been limited largely to improvement in the clinical service. Three part-time physicians have been added to the clinic staff and new equipment has been installed. Clinic hours have been increased from 22 hours per week to 34 hours per week. One full-time nurse has been added to the clinic, making four in all. In addition, nurses are assigned to clinic sessions for 9 half-days a week, and these also follow up selected cases.

Additional facilities have been provided for the treatment of infants with congenital syphilis, especially the children of women who have been under treatment during the prenatal period.

An associate bacteriologist has been employed in the health department laboratory, and an allowance of $600 per year has been made for the purchase of equipment and supplies. Since securing this allotment it has been possible to extend the work of examining food handlers and employees in business establishments.

Georgia.—An assistant chief of the division of venereal disease control has been employed. He is engaged in educational work and is addressing both professional and lay groups. Clinics for the examination of pregnant women are being held.

Idaho.—The first step in the program for Idaho was a State-wide venereal disease survey made by an officer of the Public Health Service. The recommendations in this report will be followed by the State health officer. Drugs are being distributed to private physicians for the treatment of both syphilis and gonorrhea, and one clinic has been established.

An educational program consisting of talks by staff members, articles in the monthly bulletin, and the distribution of literature relating to syphilis and gonorrhea, is being conducted.

Illinois.—A full-time venereal disease control officer has been appointed.

Iowa.—Efforts are being made to stimulate case reporting. When an early case is reported, physicians are furnished with neoarsphenamine and a bismuth preparation sufficient for 10 treatments. A copy

of the reprint "Standard Treatment Procedure in Early Syphilis" is also forwarded to physicians who report cases.

An assistant epidemiologist who will give part time to venereal disease control work has been appointed.

Kansas.—A full-time venereal disease control officer who had been given a special course of training was appointed on July 1. Under the guidance of an officer of the Public Health Service, a study of the venereal disease problem has been made, which included a survey of the clinics in the three large cities of the State—Kansas City, Wichita, and Topeka.

Maine.—Five new clinics are being equipped and are practically ready for work. Clinics will be located in 11 of the 20 cities in Maine.

Maryland.—Nine new clinics have been established. A division of venereal diseases in the bureau of communicable diseases of the State department of health has been created.

All State-operated or subsidized clinics have been inspected and approved. Uniform records and standards for the admission of patients, and uniform methods of treatment have been adopted.

Provision has been made at Johns Hopkins Hospital for the training in syphilis control work of physicians from any part of the country. Drugs for the treatment of syphilis are distributed free to all physicians desiring them regardless of the financial status of the patients.

Massachusetts.—In Massachusetts the work has centered on furthering the epidemiologic control of syphilis and gonorrhea. The follow-up service in 11 clinics has been augmented by the addition of 9 workers. The Boston metropolitan area has been divided into five districts. A worker has been assigned to each of these districts. This worker follows all the cases residing in the assigned district for all six clinics in Boston. Thus each clinic has five workers who are constantly in the field following lapsed cases and searching for contacts and sources of infection. The superintendents of the hospitals and the clinic personnel have entered whole-heartedly into this cooperative scheme and are giving it their full support.

A technician has been added to the staff of the laboratory. Orders have been placed for bismuth for distribution to clinics throughout the State.

Mississippi.—One new clinic has been organized in Vicksburg and a full-time social service worker employed. One clinic-day has been added to the clinic service in Pike County, and in Lauderdale County a full-time nurse for follow-up work has been employed.

Missouri.—The only control measure under way in Missouri is the distribution of free drugs for the treatment of syphilis to physicians upon request.

Montana.—In Montana, also, the only new work is the furnishing of free drugs for patients whose treatment would otherwise be delayed.

New Jersey.—The sum of $5,500 has been spent for drugs and supplies for distribution to clinics and physicians treating indigent cases. This is in addition to the amount purchased from State funds. Educational pamphlets to the number of 40,000 have been purchased; 10,000 reprints of the article Why Don't We Stamp Out Syphilis? are included.

A physician has been appointed as assistant to the consultant, whose chief work has been a survey of all the 36 clinics in the State. He is also assisting in the general program to improve the dark-field and Wassermann service.

Newark has been given $10,000 with which to increase venereal disease control work. A physician has been engaged on a full-time basis to assist in carrying out the program. Clinic physicians are being paid on a part-time basis, and drugs have been purchased for the use of private physicians in the city for the treatment of certain types of patients.

New York.—There have been no essential changes in the activities in New York State, where the program was well developed before Social Security funds were available. A program for the control of syphilis approved by the State department of health has been established in Albany, making the fourth city in the State in which such programs were in operation on October 1, 1936.

North Carolina.—A venereal disease control officer was appointed who was to assume his duties on October 1, 1936.

Ohio.—A part-time assistant venereal disease control officer has been employed. Better reporting is being stressed. Working with the health commissioner, every physician, dentist, and druggist in his district is interviewed personally. A reprint of the article Why Don't We Stamp Out Syphilis? is given each physician. Usually talks are made before the local medical society, and it is again explained that free arsenicals and free diagnostic service is available in all cases. The importance of the early treatment of syphilis is stressed and the practice of taking routine Wassermann tests of all expectant mothers is urged.

Lectures are also given before various civic organizations, clubs, and nurses' meetings. An exhibition of placards and charts has been shown at county fairs and before the Ohio State Medical Association. The film For All Our Sakes has been shown to civic organizations as well as to medical societies.

Pennsylvania.—An assistant full-time medical officer has been added to the staff of the division of genito-urinary clinics. An officer of the Public Health Service is assisting in the reorganization of the old program. Eleven nurses were given special training as medical investigators and have been stationed in different areas of the State to investigate sources of infection and to follow up contacts among clinic and private patients.

Nine new treatment centers have been established, bringing the total number of clinics in the State up to 76. Clinics have been furnished with additional equipment and drugs. A more liberal policy has been adopted in the matter of furnishing free drugs to physicians for treatment of syphilis.

Rhode Island.—Special attention is being given to epidemiologic investigations. The efficiency of these investigations has greatly increased since the establishment of district health units was made possible by Social Security funds.

Hospitals have been asked to make routine Wassermann tests on all patients admitted either to the out-patient department or to the hospital. Thus far the response has been poor, but efforts to obtain the cooperation of the hospitals will be continued.

South Carolina.—Efforts are confined to the control of syphilis. The cooperation of the medical societies in the State has been sought. The sum of $3,000 has been allotted for the purchase of drugs for the treatment of syphilis.

Tennessee.—A full-time venereal disease control officer has been employed in the State.

Texas.—A full-time venereal disease control officer has been employed. New forms for reporting cases of venereal disease and new pamphlets for general distribution have been prepared and are ready for printing.

Vermont.—Drugs were formerly furnished for indigent patients, but now are furnished to all patients through the private physician.

Washington.—A full-time venereal disease control officer has been appointed and a comprehensive program planned. The epidemiologic program, which has for its aim an interview with every patient regarding the source of infection and contacts, was under way on October 1, 1936.

Public health nurses are available for the follow-up of private patients.

West Virginia.—Two clinics have been reorganized. Several motion-picture films have been purchased.

Alaska.—A laboratory has been established, the services of which are free.

PROGRESS IN STATES BY TYPE OF MEASURES ADOPTED[3]

DIVISION OF VENEREAL DISEASE CONTROL

Separate divisions of venereal disease control have been established in three States, Kansas, Maryland, and Texas, making 16 States in all that now administer their programs for venereal disease control

[3] Slides of outline maps have been made showing the States which have adopted the different control measures mentioned here. These slides may be secured on request to the Surgeon General of the Public Health Service.

through separate divisions. The other 13 States are Connecticut, Georgia, Indiana, Kentucky, Maine, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, West Virginia, and Wisconsin.

FULL-TIME CONTROL OFFICER

Seven States, Illinois, New Jersey, North Carolina, South Dakota, Texas, Tennessee, and Washington, have added a full-time venereal disease control officer to the staff of the department of health. Nine States, Connecticut, Georgia, Indiana, Massachusetts, New York, Ohio, Pennsylvania, Rhode Island, and West Virginia, already had full-time officers.

FREE DRUGS FOR TREATMENT FURNISHED ALL PATIENTS

There appear to be only three States, Maryland, New York, and Vermont, in which drugs for the treatment of syphilis are furnished free for the treatment of all classes of patients, Vermont being the only State to add this service since Social Security funds became available.

FREE DRUGS FURNISHED INDIGENT PATIENTS

Free drugs for the treatment of indigent patients have been provided for several years in 30 States and the District of Columbia, at least to a limited degree. They are now distributed in seven additional States, viz, Idaho, Louisiana, Mississippi, Missouri, Montana, South Carolina, and Washington. In Missouri and Montana no other new work is reported as having been started by October 1, 1936. On that date, Arkansas, Colorado, Kansas, Nevada, North Carolina, North Dakota, Texas, Utah, and Wyoming were not providing antisyphilitic drugs through their State health departments.

DARK-FIELD EXAMINATION FOR PRIVATE PATIENTS

Vermont is the only State in which dark-field examination for private patients has been provided for from Social Security funds, making 21 States in which this service is now available. These States are Delaware, District of Columbia, Georgia, Illinois, Louisiana, Maine, Maryland, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Rhode Island, Utah, Vermont, West Virginia, and Wisconsin. Is your State among these?

Most State health officers report that their departments include laboratories where serologic tests for the diagnosis of syphilis are performed free upon the request of any physician. Wyoming had no such laboratory. In Colorado, Iowa, Kansas, Oregon, and Texas some limitation is placed upon serologic tests; a charge for the service is made or the tests are for indigent people only. The universal need for free serodiagnostic tests, efficiently performed and

available to all, can best be appreciated when it is recalled that such tests constitute one of the two most important laboratory methods of control.

EPIDEMIOLOGIC MEASURES

Epidemiologic investigations seem to have fared rather better than some other projects. Eight States, Delaware, Maryland, Massachusetts, Mississippi, New Jersey, Pennsylvania, Rhode Island, and Washington, and the District of Columbia report increased facilities for follow-up work. Epidemiologic measures were reported in all States except Arizona, Arkansas, Colorado, Florida, Missouri, Montana, Nevada, New Mexico, Ohio, Oklahoma, South Carolina, Texas, and Wyoming.

REPORTING CASES OF SYPHILIS AND GONORRHEA

During the year July 1, 1935, to June 30, 1936, there were 26 States and the District of Columbia in which the number of reported cases of syphilis and gonorrhea was more than 2 per 1,000 of the population in the State. It is hardly necessary to remind a group of health officers that this gives an indication of the relative completeness of morbidity reporting rather than the actual prevalence of these diseases. The States reporting more than 2 cases of syphilis and gonorrhea per 1,000 population are as follows: Alabama, Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, Washington, and West Virginia.

MORE THAN ONE CLINIC PER 100,000 POPULATION

According to recently compiled data there are about 1,000 free, pay, and part-pay clinics for the treatment of syphilis and gonorrhea in the United States, or approximately one clinic to every 130,000 of the population. In 15 States, California, Connecticut, Delaware, Kentucky, Maine, Maryland, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Pennsylvania, Rhode Island, Tennessee, and West Virginia, and the District of Columbia the ratio of clinics to population is greater than this. It is to be noted that the efficiency of clinic operation has not been considered here although it is a factor of the greatest importance.

It is well established that both syphilis and gonorrhea are more prevalent among Negroes than among white persons. The section of the country which has the largest Negro population, and, therefore, needs facilities for the treatment of venereal diseases more than any other section, is providing fewer clinics to supply this treatment than the average for the whole country. The same deficiency exists in

the majority of the States, the only mitigating circumstances being that the need for free treatment is probably not so great in sections with smaller Negro and urban populations.

DIRECT EXPENDITURES FOR VENEREAL DISEASE CONTROL

Direct expenditures for the control of venereal disease (that is, exclusive of laboratory maintenance) are very small. In only six States (Delaware, Idaho, Massachusetts, New Jersey, New York, and Utah) is the amount as much as 1 cent per capita. In one or two States it is less than 1 mill. Delaware carried the honors with 3 cents per capita.

No real headway against such widely prevalent diseases as syphilis and gonorrhea can be expected so long as these small and, in some instances, trifling sums are alloted for the program.

THE WORK MUST GO FORWARD

Venereal disease control measures which have been instituted vary both in number and in comprehensiveness. A total of 25 States, the District of Columbia, and Alaska, report the development of new work under the provisions of the Social Security Act. This is encouraging, especially because of the tendency of many health officers until recently to regard as of questionable value the practicability of venereal disease control work. The experience of foreign countries in the control of syphilis and a growing public interest have stimulated action. In addition, the success attained in several States in this country with more progressive health departments has augured well for the future of the program. The worthwhile attainments of the States now adopting new measures for venereal disease control will without doubt serve as an increased incentive to the rapid expansion of this work. United and sustained effort by all health officers is necessary and will be achieved. The syphilis problem is a national one.

A recent event which apparently indicates the active interest of the medical profession was the action of the presidents and secretaries attending the Conference of Presidents and Secretaries of State Medical Societies in Chicago last month. Following the unanimous approval of those present at this meeting, the Surgeon General has requested the appointment of a committee, representing the State society, which will recommend a practical local program for the control of syphilis and gonorrhea. An advisory committee of this kind has already been appointed by presidents in 21 State medical societies. Five reports have already been submitted by the committees in as many States. The plan calls for the submission of the report not only to the Public Health Service but also the State health officer.

CONCLUSIONS

The evidence which has been accumulated in this report indicates an urgent need for the adoption of the following measures in the campaign against syphilis and gonorrhea in this country:

1. The appointment of a full-time venereal disease control officer in every State department of health.
2. A much more liberal policy with regard to the free distribution of antisyphilitic drugs.
3. More general use of the dark-field examination, either direct or delayed, in the diagnosis of early syphilis.
4. More widespread use of epidemiologic investigations in the control of syphilis.
5. Greater persistence on the part of health officers in the attempt to obtain reliable morbidity and mortality reports.
6. The development of more and better facilities for diagnosis and treatment.
7. The adoption of reasonable standards of efficiency by State health departments before formal recognition is given to clinics for the treatment of syphilis and gonorrhea.
8. A much more liberal allotment of funds for direct expenditures in the control of the venereal diseases.

SOURCES OF INFECTION AND SEASONAL INCIDENCE OF TULARAEMIA IN MAN[1]

By Edward Francis, *Medical Director, United States Public Health Service*

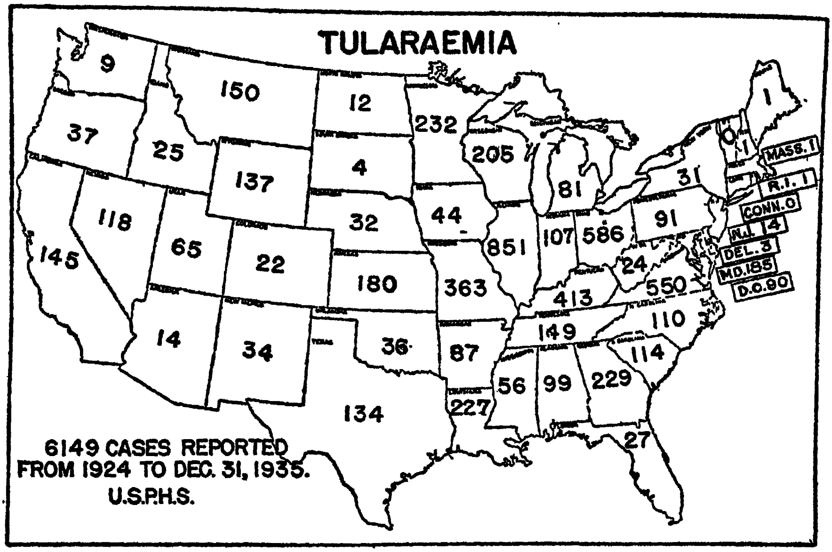
Tularaemia is an acute infectious disease caused by *Bacterium tularense* and occurs under natural conditions in over 20 kinds of wildlife, especially in wild rabbits and hares. Man becomes infected by contact of his bare hands with the raw flesh and blood of these animals or by bites of blood-sucking ticks and flies which have previously fed on animals infected with *Bacterium tularense.*

History.—Tularaemia has been elucidated from beginning to end by American investigators alone. The disease was discovered in 1910 (then called a "plague-like disease of rodents") by Dr. George W. McCoy of the United States Public Health Service, in the ground squirrels of Tulare County, Calif.—hence the name tularaemia. This name was given to the disease by the writer in 1920 after establishing the identity of the California rodent disease and "deer-fly fever" in man in Utah following an investigation of an outbreak of the latter disease in that State.

Geographic distribution.—Human cases have been recognized in 46 States of the United States and in the District of Columbia. The only States in which cases have not been recognized are Vermont and

[1] From the National Institute of Health, Washington, D. C.

Connecticut. The disease was reported in Japan in 1925, in Russia in 1928, in Norway in 1929, in Canada in 1930, in Sweden in 1931, and in Austria in 1935.



MAP 1.—Distribution of cases of tularaemia by States over a 12-year period.

Cases reported in the United States

	Cases	Deaths
Previous to 1924	15	2
1924, 1925, and 1926	308	11
1927	251	10
1928	350	10
1929	462	36
1930	659	37
1931	675	32
1932	933	41
1933	892	33
1934	881	48
1935	748	39
Total	6,174	299
Case fatality, 4.8 percent.		

SOURCES OF HUMAN INFECTION

Bacterium tularense is known to have reached man directly from over 20 sources, comprising the following great variety of animal and insect hosts of the infection in nature:

Wild rabbits and hares.—Cottontail rabbit, *Sylvilagus floridanus*; jack rabbit, *Lepus*, sp.; snowshoe hare, *Lepus bairdi*. These animals are the direct cause of over 90 percent of human cases in the United States. It is estimated that about 1 percent of them are naturally infected.[3] The disease is a bacteraemia among them and is spread

[3] Public Health Reports, 38: 1391 (1923). Mil. Surgeon, 53: 164 (1923).

from rabbit to rabbit principally by the rabbit tick, *Haemaphysalis leporis-palustris*, but also by other blood-sucking arthropods—ticks, lice, and fleas. The rabbit tick, the rabbit louse, and the rabbit flea do not bite man, and therefore they are not a source of human infection. Rabbits raised under domestic conditions in rabbitries and hutches, although highly susceptible, have not been found naturally infected, due probably to their freedom from ticks.

Market men, hunters, housewives, and others who dress rabbits with bare hands become infected. In the majority of human cases a wound of entry has been inflicted at the site of cutaneous infection either at the time of infection or shortly before or after. These wounds consist of cuts, punctures, or scratches by fragments of shot-shattered rabbit bone or by knife, nail, barbed wire, thorn, brier or burr, or splinter of wood, etc. Since the organism will penetrate the normal skin, a wound of entry is not necessary for infection.

Wood ticks, Dermacentor andersoni, have caused 53 cases in Montana and surrounding States. The dog tick *Dermacentor variabilis* has caused 65 cases in the Southern States. Ticks bite under the clothing or hidden in the hair.

Horse flies, Chrysops discalis, have caused 68 cases in Utah and surrounding States. They bite on the exposed parts of the body. Thirty of 170 enrollees in a CCC camp in Utah became infected in July 1935. Their unusual sites of infection were located on the back because the boys, when at work, were stripped to the waist.

Sheep contact has caused 12 cases in the Northwest among shearers, butchers, and herders, the infection entering the hands from contact with wood ticks and their feces located in the wool. Sheep are only very slightly susceptible.

Insect bites (species undetermined) caused 9 cases. One infected person had picked ticks from a dog and crushed them with his fingers.

Tree squirrels had been dressed by 10 patients. Nine had killed and skinned *opossums*. One case each followed the dressing or skinning of a *sage hen, coyote, deer, red fox,* or *bull snake*. Two cases each followed like contact with *quail, ground hog, muskrat, hog,* or *skunk*. Two had been scratched by *cats*. Single cases have resulted from *bites* of cat, skunk, coyote, tree squirrel, Montana ground squirrel, opossum, dog, hog, lamb, and a white rat; here contamination of the animal's mouth parts is assumed.

Laboratory infection of man.—In 13 laboratories in the United States, England, Japan, and Russia, 41 workers contracted the disease performing necropsies of infected guinea pigs and rabbits or from handling infected living ticks. Infection penetrated the skin of the hands.

Ingestion of insufficiently cooked wild-rabbit meat caused 20 cases in 5 families in the United States, of whom 12 died. A *water-borne*

epidemic of 43 cases was reported in 1935 from Russia in peasants who drank water from a brook which was thought to have been contaminated by water rats.

Water rats, Arvicola amphibius, caused an explosive outbreak of about 1,000 cases in Russia in 1928 in persons who skinned them for their pelts, not knowing of that reservoir of infection.

Eye infections.—In a total of 68 cases the conjunctiva was the primary seat of infection. The infection was transferred to the eye by the hands while dressing rabbits in 52 cases; after crushing flies or ticks between the fingers in 11 cases; bloody washings of a rabbit or bile of a ground hog spurted into the eyes in 3 cases; and 1 case followed the dressing of rabbits and tree squirrels. Only three eye cases showed a simultaneous lesion on the hands.

California ground squirrel.—Although this is the animal in which McCoy discovered the disease in 1910, human cases have not yet been traced to it. But, should its fur acquire a remunerative commercial value, then we may expect human cases to arise from skinning this animal, just as the price of 15 kopecks per water-rat pelt unearthed a hitherto unknown reservoir of infection in Russia and caused the above-mentioned outbreak.

Potential sources of human infection.—Animals in the United States from which *B. tularense* has been isolated in nature but which have not yet caused human cases are as follows: California ground squirrels, gray foxes of Minnesota, wild rats of Los Angeles, field mice of California, ground squirrels of Utah and Montana, ruffed grouse and sharp-tailed grouse in Minnesota, prairie dog in Utah, the tick *Dermacentor occidentalis* in California, and the rabbit fleas of Minnesota.

SEASONAL INCIDENCE

Seasonal incidence of cases of tularaemia is due to the seasonal variation of three sources of infection—tick bite, fly bite, and the dressing of wild rabbits; but, owing to the overlapping of these influences, cases have occurred in the United States in every month of the year.

(1) *Dressing wild rabbits.*—November and December have been the months of onset for nearly all cases occurring east of the Mississippi River resulting from the dressing of wild cottontail rabbits for food. These months embrace the "open season" when, owing to temporary abeyance of the State game laws, the hunting of cottontail rabbits as a sport is generally permitted and, consequently, these rabbits are then offered for sale in great numbers in the markets. Ohio, Pennsylvania, and Illinois furnish striking illustrations of the absence of cases during the 10 months of "closed season" when rabbits are protected, as against the abundance of cases during the 2 months of "open season." (See table 1.)

TABLE 1.—*Months of onset and number of cases of tularaemia due to bites of horse flies, wood ticks, and dog ticks, and to the dressing of wild rabbits during the 12-year period ended Dec. 31, 1935*

	January	February	March	April	May	June	July	August	September	October	November	December
Chrysops discalis (horse flies)						Utah 4 Wyoming 2 Oregon 1 Montana 1	Utah 33 Wyoming 6 Idaho 1 Oregon 2 Colorado 2 Nevada 7 Minnesota 1	Utah 1 Wyoming 2 Idaho 1 Oregon 1 Nevada 1	Wyoming 1			
Total						8	52	6	1			
Dermacentor andersoni (wood tick)			Montana 2	Montana 3	Montana 16 Nevada 1 Wyoming 7 Idaho 3	Montana 6 Wyoming 2 S. Dakota 1	Montana 4 Nevada 1 N. Dakota 1 California 1	Montana 2 Nevada 3				
Total			2	3	27	9	7	5				
Dermacentor variabilis (dog tick)	Texas 1	Louisiana 1	Louisiana 2 Arkansas 1 Georgia 1	Louisiana 5 Arkansas 3 Texas 2 Tennessee 1 Missouri 2	Louisiana 3 Arkansas 2 Texas 2 Tennessee 2 Missouri 3 Illinois 1	Louisiana 1 Arkansas 1 Tennessee 1 Missouri 2 Maryland 1 Minnesota 1	Louisiana 2 Arkansas 1 Texas 3 Virginia 4	Tennessee 1	Louisiana 1	Louisiana 2		
Total	1	1	4	13	13	7	10	1	1	2		
Dressing wild rabbits:[1]												
Ohio[2]	1	1						2			69	13
Pennsylvania[3]	4									1	28	12
Illinois[4]	1									1	23	18

[1] Numbers for Ohio, Pennsylvania, and Illinois represent only that portion of total cases for which the exact month of onset is accurately recorded.
[2] "Open season" for rabbits Nov. 15 to Dec. 31. [3] "Open season" for rabbits Nov. 1 to Nov. 30. [4] "Open season" for rabbits Nov. 1 to Jan. 31.

Jack rabbits are found almost exclusively west of the Mississippi River; and since they are a pest to farmers, they are unprotected by the game laws and their destruction is often rewarded by a bounty. Cases west of the Mississippi River due to the activities of skinning and cutting up wild jack rabbits for fish bait, coyote bait, chicken feed, dog feed, fox feed, and for the table, are without seasonal incidence.

(2) *Fly bite.*—June, July, August, and September have been the months of onset of 67 cases due to the horse fly, *Chrysops discalis*, which occurs in Utah and the surrounding States and which has its greatest activity in the months named. (See table 1.) This fly feeds on horses, cattle, rabbits, and man, hence the transfer of infection from rabbit to man.

(3) *Tick bite, Dermacentor andersoni.*—March to August are the months recorded for the onset of 53 cases of tularaemia due to the wood tick *Dermacentor andersoni* which occurs principally in Montana and the surrounding States (see table 1). These months correspond with the season of greatest activity of this tick. This tick becomes infected in the larval or nymphal stages by feeding on an infected rabbit and it infects man when, later, as an adult, it feeds on him.

(4) *Tick bite, Dermacentor variabilis.*—January to October are the months recorded for the onset of 53 cases of tularaemia due to the dog tick *Dermacentor variabilis* which is distributed widely throughout the Eastern and Southern States and feeds on dogs, rabbits, and man (see table 1).

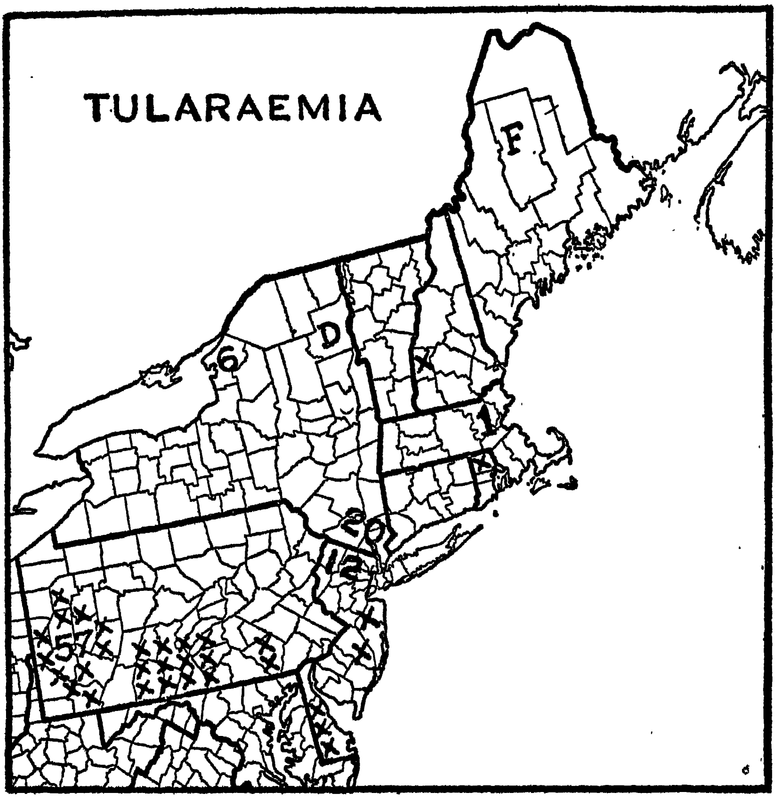
OCCURRENCE IN NORTHEASTERN UNITED STATES

One is struck by the small number of cases occurring in the States comprising the northeastern section of the United States (see map 1). Analysis of these cases as to source of infection reveals the very small proportion of them which are tracable to hunting and skinning the local native wild rabbits found within the borders of these States (see map 2). On the other hand, the large percentage of them have skinned "market rabbits" bought in the large municipal markets to which they have been shipped from western and southern localities and held in cold storage. Detailed analysis as to sources of infection of cases which have become infected within the borders of the Northeastern States during the 11-year period ended December 31, 1935, follows:

Maine.—Case "F", a trapper, contracted tularaemia in November 1933 at Kokadjo, on Moosehead Lake, from skinning a red fox, and died February 6, 1934. Dr. George H. Coombs, State Health Commissioner, sent to the National Institute of Health portions of approximately 100 red foxes, two of which yielded cultures of *Bacterium tularense* by guinea pig inoculation, thus demonstrating the infection

in nature in red foxes in Maine. Portions of approximately 100 wild rabbits, shot in Maine and forwarded by Dr. Coombs were found negative for tularaemia at the National Institute of Health.

New Hampshire.—One person became ill of tularaemia on November 23, 1931, at Claremont, N. H., after dressing 2 rabbits killed near Claremont.



MAP 2.—Sources of infection of cases of tularaemia in Northeastern United States during the 11-year period ended Dec. 31, 1935. *X* denotes a case due to dressing a native wild rabbit hunted and killed in the immediate locality. *Numbers* denote cases due to dressing shipped market rabbits in Pittsburgh, New York, Buffalo, Boston, or New Jersey. *F* denotes a case due to skinning a red fox. *D* denotes a case due to skinning a deer.

Vermont.—No cases of tularaemia reported.

Massachusetts.—One person contracted tularaemia on December 31, 1929, in Boston after dressing a cold-storage rabbit obtained in the Boston market.

Rhode Island.—One man contracted tularaemia on May 6, 1929, at North Scituate, R. I., after tearing apart 3 rabbits found dead on his farm.

Connecticut.—No cases of tularaemia reported.

chance there is an open sore or cut on the hands, the infection travels from the rabbit's blood or liver into the wound on the hand causing tularaemia, or rabbit fever. When a rabbit is shot, its bones become shattered into sharp fragments. If, in dressing an infected rabbit, one of these fragments of bone pierces the skin of the hands, the infection enters at that point. About 3 days after exposure to infection, illness begins with headache, chilliness, vomiting, aching pains all over the body, and fever. The patient thinks that he has the "flu" and goes to bed. The sore on the hand develops into an ulcer (fig. 5). The glands at the elbow or in the armpit become enlarged, tender, and painful, and later may develop into an abscess (fig. 6). There is sweating, loss of weight, and debility. Illness lasts about 3 weeks and is followed by a slow convalescence covering a period of 2 or 3 months. Most patients recover without any bad after effects, but about 5 percent die, especially if the case is complicated by pneumonia.

Diagnosis.—The history of tick-bite, fly-bite, or wild rabbit contact especially, or contact with other animals, when coupled with fever, an ulcer on the skin, and regional lymph-node enlargement, should call attention to tularaemia. Diagnosis is made conclusive by obtaining agglutination of *Bacterium tularense* by the patient's serum or by obtaining a culture of the organism from the patient's ulcer or lymph nodes following guinea pig inoculation, or by obtaining a positive skin reaction using an antigen prepared by Foshay of Cincinnati for intradermal injection.

Immunity.—One who has recovered from an attack of tularaemia need not fear a second attack, because he is then immune to the disease. There is no record of a second attack in man.

Noncontagiousness.—There is no record of the transfer of the infection from man to man. Doctors, nurses, and attendants on the sick have not contracted the disease.

Prevention.—Keep the bare hands out of a wild rabbit. Rubber gloves afford reasonable protection to those who must dress wild rabbits and other animals, but sharp fragments of rabbit bone can easily pierce a rubber glove and puncture the hand. Employ immune persons when contact with infected material is necessary. Thorough cooking of all wild game, especially rabbits, is essential. Infected meat is rendered harmless for food by thorough cooking; but if any red juice is allowed to remain about the bones, the germs will remain alive and virulent in it. The liberal use of soap and water and disinfection of the hands are recommended to remove rabbit blood from the hands, or even when the hands have come in contact with the rabbit's fur. The ordinary disinfectants are effective. Disinfection of bites, cuts, punctures, and scratches should be practiced, but this measure has often failed to prevent infection. Disinfection of ulcers,

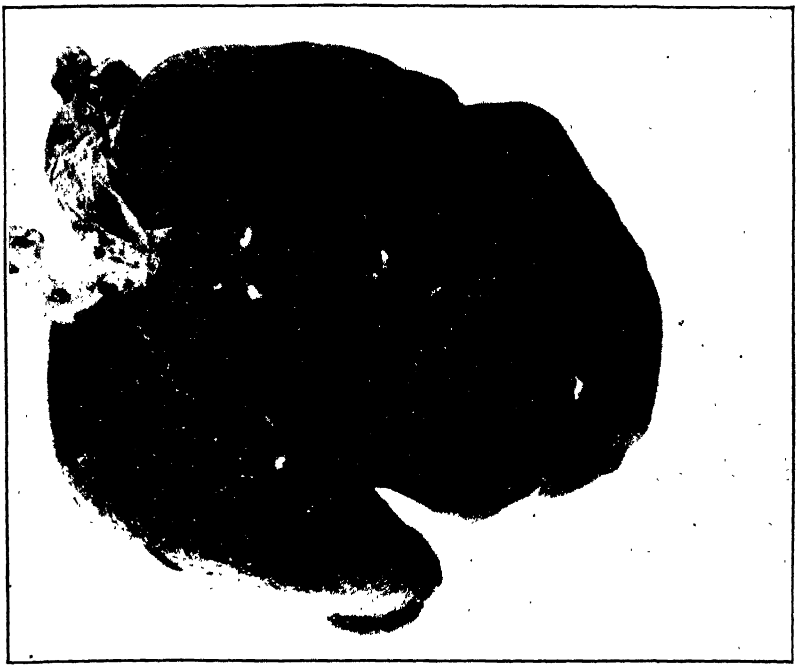


FIGURE 1.—Liver of domesticated rabbit dead fourth day. (Army Medical Museum, no. 48265.)

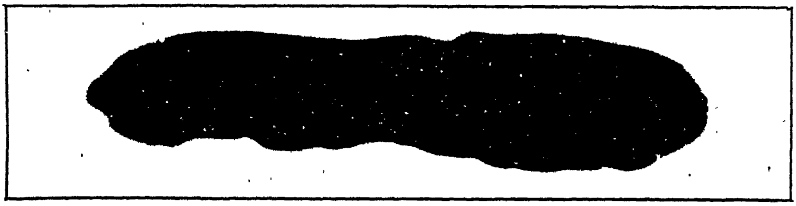


FIGURE 2.—Spleen of domesticated rabbit dead fourth day. (Army Medical Museum, no. 48266.)

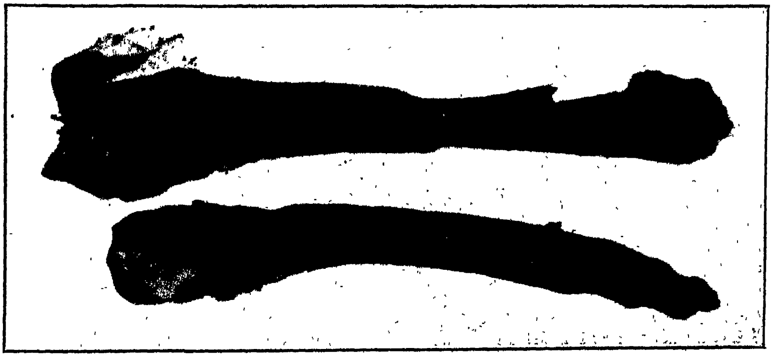


FIGURE 3.—Marrow of femurs of domesticated rabbit dead third day. (Army Medical Museum, no. 48267.)

FIGURE 4.—Primary ulcer on the temple following bite of fly, *Chrysops discalis*, in Utah. (Francis, Army Medical Museum, no. 42955.)

FIGURE 5.—Primary ulcer on finger following dressing of wild rabbits, 18 days after onset. (Dr. Tomas Cajigas, Army Medical Museum, no. 63174.)

abscesses, sputum, conjunctival secretion, urine, and feces of patients would seem indicated, but no case has been traced to these sources. Isolation, quarantine, and house disinfection are not indicated.

FIVE HUNDRED CASES OF SCARLET FEVER CAUSED BY USE OF RAW MILK FROM INFECTED COW

A recent epidemic of approximately 500 cases of scarlet fever in Oswego, Tioga County, N. Y., has been traced to the use of raw milk from an infected cow, according to a statement issued by the State department of health. The source of the outbreak was suspected early in the epidemic, and the sale of raw milk from the dairy concerned was stopped on December 23, 1936. This action was followed by a rapid decline in the number of cases.

The investigations revealed that the suspected animal had been taken into the herd at the dairy farm a few days before the beginning of the outbreak. Immediately prior to that time the cow had been on a farm on which it was learned there had occurred three cases of scarlet fever, one of which was in a boy who had milked the cow. The evidence indicated that the animal had acquired the infection there and was infected when sold to the dairy farm.

As a result of this outbreak of scarlet fever, and the determination of its cause, the town of Oswego has passed an ordinance requiring the pasteurization of all milk sold there.

DEATHS DURING WEEK ENDED JANUARY 2, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 2, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	10,425	9,865
Deaths per 1,000 population, annual basis	14.5	13.8
Deaths under 1 year of age	635	598
Deaths under 1 year of age per 1,000 estimated live births	57	54
Data from industrial insurance companies:		
Policies in force	69,023,395	67,860,830
Number of death claims	11,799	11,468
Death claims per 1,000 policies in force, annual rate	8.9	8.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 9, 1937, and January 11, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 9, 1937, and Jan. 11, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936
New England States:								
Maine	1	4	41	5	99	235	0	0
New Hampshire					24	42	0	0
Vermont		2			10	117	0	0
Massachusetts	7	12			930	269	3	5
Rhode Island	1				146	138	1	0
Connecticut	4	4	67	1	170	87	3	1
Middle Atlantic States:								
New York	62	43	[1] 1,783	[1] 17	375	971	9	19
New Jersey	22	15	118	14	437	41	5	3
Pennsylvania	50	84			83	365	5	10
East North Central States:								
Ohio	28	45	10	14	31	73	3	6
Indiana	16	51	346	39	10	11	2	3
Illinois	30	77	390	57	19	57	9	13
Michigan	11	9	66	1	19	82	2	3
Wisconsin	7	2	655	35	27	77	3	2
West North Central States:								
Minnesota	12		25		38	122	2	1
Iowa	4	12	2,854	2	6	11	3	5
Missouri	11	37	621	215	2	16	3	1
North Dakota	2		66			27	0	1
South Dakota		1	42		5	26	0	0
Nebraska		9	51		1	79	3	0
Kansas		12	876	32	8	18	1	3
South Atlantic States:								
Delaware	4	1	8		184	203	0	0
Maryland [2]	18	14	61	24	230	98	5	6
District of Columbia	17	22	15	1	16	2	5	5
Virginia	48	25			112	19	8	3
West Virginia	12	15	76	87	28	2	2	7
North Carolina [3]	45	21	34	9	43	13	2	3
South Carolina [3]	13	1	720	401	16	7	2	0
Georgia [3]	15	13		276			3	3
Florida [3]	13	7	7	5	3	1	7	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 9, 1937, and Jan. 11, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936
East South Central States:								
Kentucky	14	32		79	199	83	19	8
Tennessee	13	37	318	131	9	1	4	14
Alabama [3]	27	20	250	352	2	21	3	0
Mississippi [2]	5	6					0	1
West South Central States:								
Arkansas	2	16	283	94	2		2	8
Louisiana	13	13	47	15	7	23	0	1
Oklahoma [4]	8	15	140	183	14	1	0	16
Texas [3]	86	74	756	271	160	23	2	11
Mountain States:								
Montana	1		637	7	2	9	4	1
Idaho		2	39		102	61	0	0
Wyoming	7	1			1	4	0	0
Colorado	5	7	77		6	5	1	1
New Mexico	5	4	22	12	10	2	1	1
Arizona	5	7	283	95	78	1	5	3
Utah [2]					126	3	0	0
Pacific States:								
Washington	2		7		32	338	1	0
Oregon	1	12	171	24	8	686	0	0
California [3]	30	32	183	63	126	733	10	4
Total	677	816	12,145	2,561	3,956	5,203	143	174

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936
New England States:								
Maine	0	1	22	15	0	0	2	0
New Hampshire	0	0	4	6	0	0	0	0
Vermont	0	0	9	12	0	0	1	1
Massachusetts	0	1	228	330	0	0	2	0
Rhode Island	0	0	24	26	0	0	0	1
Connecticut	0	0	68	78	0	0	1	3
Middle Atlantic States:								
New York	2	0	687	754	3	0	5	10
New Jersey	0	2	197	158	0	0	4	4
Pennsylvania	0	3	508	536	0	0	11	9
East North Central States:								
Ohio	0	1	234	346	4	0	12	3
Indiana	0	0	174	269	15	3	2	0
Illinois	3	0	473	708	12	19	9	5
Michigan	2	0	421	346	0	0	1	2
Wisconsin	1	0	274	495	11	13	0	1
West North Central States:								
Minnesota	0	0	131	368	13	7	0	1
Iowa	0	0	100	185	33	12	1	0
Missouri	0	0	126	273	47	0	2	1
North Dakota	0	0	30	104	25	16	0	0
South Dakota	0	0	54	100	2	27	1	0
Nebraska	0	0	37	160	8	56	2	1
Kansas	0	0	167	143	13	13	8	8
South Atlantic States:								
Delaware	0	0	19	15	0	0	0	0
Maryland [3]	0	1	106	96	0	0	2	6
District of Columbia	1	0	18	24	0	0	0	5
Virginia	0	0	58	66	0	0	1	1
West Virginia	2	0	60	53	0	0	2	0
North Carolina [3]	0	1	52	31	0	0	4	1
South Carolina [3]	0	2	10	6	0	0	4	0
Georgia [3]	1	0	7	18	0	4	8	3
Florida [3]	0	0	14	5	0	0	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 9, 1937, and Jan. 11, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936	Week ended Jan. 9, 1937	Week ended Jan. 11, 1936
East South Central States:								
Kentucky	0	0	63	86	0	1	8	7
Tennessee	2	1	50	50	0	0	3	0
Alabama [3]	0	0	22	24	0	0	4	2
Mississippi [2]	0	0	11	10	1	0	1	5
West South Central States:								
Arkansas	1	0	18	11	0	0	2	3
Louisiana	1	0	29	18	1	1	11	4
Oklahoma [4]	0	0	17	36	0	0	2	6
Texas [3]	1	0	79	90	4	0	9	4
Mountain States:								
Montana	0	0	35	211	26	34	0	2
Idaho	0	1	28	54	7	2	0	1
Wyoming	0	0	18	91	4	0	0	0
Colorado	0	0	58	167	3	0	0	0
New Mexico	0	0	35	37	0	0	9	6
Arizona	0	0	15	33	0	0	1	0
Utah [2]	0	0	8	97	0	0	0	0
Pacific States:								
Washington	1	0	50	69	5	31	3	2
Oregon	0	1	34	53	27	2	3	3
California [3]	3	7	285	323	12	12	5	9
Total	21	22	5,167	7,176	275	253	137	121

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 9, 1937, 44 cases, as follows: North Carolina, 2; South Carolina, 1; Georgia, 24; Florida, 2; Alabama, 3; Texas, 11; California, 1.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1936										
Massachusetts	6	16	------	2	254	1	11	362	0	8
November 1936										
Massachusetts	8	24	------	1	414	1	1	493	0	6
New Hampshire	------	------	------	------	------	------	0	27	0	0
South Dakota	------	2	2	------	12	------	3	199	40	5
December 1936										
Arkansas	3	27	129	13	3	2	10	45	1	11
Connecticut	2	9	24	------	486	------	0	233	0	7
Delaware	1	20	2	------	217	------	0	68	0	5
District of Columbia	9	48	8	------	28	------	0	60	0	11
New Hampshire	------	1	10	------	------	------	0	27	0	1
North Carolina	15	310	56	------	83	13	3	254	2	23
West Virginia	------	81	297	------	88	------	1	236	0	22

October 1936

	Cases
Massachusetts:	
Chicken pox	830
Dysentery (bacillary)	4
German measles	38
Lead poisoning	3
Mumps	247
Paratyphoid fever	1
Ophthalmia neonatorum	81
Rabies in animals	4
Septic sore throat	6
Tetanus	1
Undulant fever	6
Whooping cough	667

November 1936

	Cases
Massachusetts:	
Chicken pox	949
Dysentery (amoebic)	1
Dysentery (bacillary)	1
Encephalitis, epidemic or lethargic	1
German measles	45
Lead poisoning	4
Mumps	358
Paratyphoid fever	1
Ophthalmia neonatorum	91
Rabies in animals	14
Septic sore throat	6
Tetanus	2
Trachoma	1
Undulant fever	5
Whooping cough	1,095

November 1936—Continued

	Cases
South Dakota:	
Chicken pox	52
Impetigo contagiosa	2
Mumps	16
Septic sore throat	1
Trachoma	2
Whooping cough	1

December 1936

	Cases
Chicken pox:	
Arkansas	30
Connecticut	676
Delaware	96
District of Columbia	110
North Carolina	442
West Virginia	188
Conjunctivitis:	
Connecticut	14
Dysentery:	
Connecticut (bacillary)	5
North Carolina	1
West Virginia	1
Encephalitis, epidemic or lethargic:	
Connecticut	2
German measles:	
Connecticut	30
Delaware	1
North Carolina	23
Lead poisoning:	
Connecticut	1
Mumps:	
Arkansas	22
Connecticut	384

December 1936—Continued

	Cases
Mumps—Continued.	
Delaware	18
West Virginia	20
Ophthalmia neonatorum:	
North Carolina	1
Paratyphoid fever:	
Connecticut	4
Rabies, animals:	
Connecticut	2
Rocky Mountain spotted fever:	
North Carolina	1
Septic sore throat:	
Connecticut	15
North Carolina	6
Trachoma:	
Arkansas	4
Trichinosis:	
Connecticut	1
Tularaemia:	
District of Columbia	1
North Carolina	1
Typhus fever:	
North Carolina	7
Undulant fever:	
Connecticut	8
Vincent's infection:	
Delaware	1
Whooping cough:	
Arkansas	7
Connecticut	460
Delaware	28
District of Columbia	134
North Carolina	175
West Virginia	164

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 2, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	4	1	0	0	0	4	31
New Hampshire:											
Concord	0	------	0	0	1	0	0	0	0	0	11
Manchester	0	------	0	2	2	5	0	0	0	0	13
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	1	0	0	0	0	7
Rutland	0	------	0	0	0	0	0	0	0	0	7
Massachusetts:											
Boston	1	------	2	6	89	44	0	4	0	149	259
Fall River	0	------	0	0	6	1	0	2	0	0	41
Springfield	0	------	0	8	1	6	0	2	0	8	35
Worcester	0	------	0	36	11	4	0	1	1	25	68
Rhode Island:											
Pawtucket	1	------	0	0	0	0	0	0	0	0	20
Providence	1	------	0	13	11	20	0	4	0	14	66
Connecticut:											
Bridgeport	0	2	1	49	2	3	0	4	0	3	38
Hartford	0	------	0	0	8	7	0	0	0	3	69
New Haven	0	1	0	0	4	1	0	3	0	1	35
New York:											
Buffalo	0	------	1	58	18	12	0	8	0	81	169
New York	26	487	20	49	227	222	0	101	2	85	1,908
Rochester	0	1	1	0	11	5	0	1	0	18	72
Syracuse	0	------	0	21	9	19	0	0	0	25	57

City reports for week ended Jan. 2, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Jersey:											
Camden	2	2	1	1	3	2	0	1	0	2	35
Newark	0	9	0	148	8	12	0	5	0	7	100
Trenton	0	------	0	0	2	2	0	2	0	0	43
Pennsylvania:											
Philadelphia	3	1	1	6	35	142	0	21	4	132	485
Pittsburgh	6	9	3	3	43	64	0	10	1	27	209
Reading	0	------	1	2	3	2	0	1	0	40	23
Scranton	0	------	------	0	------	3	0	------	0	0	------
Ohio:											
Cincinnati	4	31	9	4	28	11	0	13	1	4	181
Cleveland	5	25	5	1	24	35	0	11	1	31	211
Columbus	3	------	0	1	10	9	0	1	0	13	114
Toledo	0	------	0	0	9	18	0	1	1	19	89
Indiana:											
Anderson	0	------	0	0	3	11	0	0	0	0	16
Fort Wayne	0	------	3	0	4	5	0	0	0	0	32
Indianapolis	0	------	7	1	31	30	0	5	2	10	112
Muncie	2	------	0	0	3	2	3	0	0	0	14
South Bend	0	------	1	0	5	1	0	0	0	0	20
Terre Haute	0	------	0	0	0	1	0	0	0	0	21
Illinois:											
Alton	0	------	0	3	1	1	0	0	0	0	9
Chicago	7	341	66	12	159	176	0	47	2	70	1,082
Elgin	0	5	1	1	2	0	0	0	0	14	15
Moline	2	------	0	0	0	1	0	0	0	4	9
Springfield	3	------	1	1	6	4	0	0	0	11	28
Michigan:											
Detroit	13	56	6	3	39	170	0	14	1	47	385
Flint	1	------	0	0	5	14	0	0	0	5	13
Grand Rapids	0	------	2	2	0	8	0	1	1	19	32
Wisconsin:											
Kenosha	0	------	1	0	2	2	0	0	0	0	11
Madison	0	------	0	0	3	8	0	0	0	1	34
Milwaukee	0	9	9	6	22	34	0	3	0	56	147
Racine	0	------	0	0	2	5	0	0	0	4	21
Superior	0	------	0	0	0	1	0	0	0	6	14
Minnesota:											
Duluth	0	------	0	0	0	15	0	0	0	5	19
Minneapolis	3	------	2	0	15	7	0	2	0	0	112
St. Paul	0	------	0	2	0	11	0	0	0	7	------
Iowa:											
Cedar Rapids	0	------	------	0	------	1	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	0	------	12	1	------	0	0	41
Sioux City	0	------	------	1	------	8	1	------	0	0	------
Waterloo	1	------	------	0	------	4	0	------	0	5	------
Missouri:											
Kansas City	5	2	1	1	15	42	0	8	1	5	106
St. Joseph	2	------	1	0	1	6	33	0	0	0	21
St. Louis	6	1	1	3	15	43	0	8	2	37	278
North Dakota:											
Fargo	0	------	0	0	1	0	0	0	0	0	12
Grand Forks	0	------	------	0	------	0	1	------	0	0	1
Minot	0	------	0	0	0	0	0	0	0	0	8
South Dakota:											
Aberdeen	0	------	------	0	------	2	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	1	1	13	6	1	0	0	2	71
Kansas:											
Lawrence	0	1	1	0	2	0	0	0	0	0	8
Topeka	0	------	1	0	5	7	0	0	0	0	26
Wichita	1	------	0	0	11	3	1	0	0	3	35
Delaware:											
Wilmington	0	------	0	54	7	1	0	0	0	1	36
Maryland:											
Baltimore	3	23	3	120	39	33	0	15	0	75	258
Cumberland	0	------	0	0	1	0	0	0	0	0	6
Frederick	0	------	0	0	0	0	0	0	1	0	3
District of Columbia:											
Washington	5	3	1	11	22	15	0	8	0	14	196
Virginia:											
Lynchburg	0	------	0	3	4	0	0	0	0	0	10
Norfolk	0	------	0	0	2	10	0	0	0	3	33
Richmond	0	------	4	0	13	2	0	6	0	0	79
Roanoke	1	------	1	0	4	0	0	0	0	1	25

City reports for week ended Jan. 2, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
West Virginia:											
Charleston	1	8	0	0	8	1	0	0	0	0	21
Huntington	0	------	--------	0	-------	0	0	-------	0	0	--------
Wheeling	1	------	1	2	4	4	0	0	0	2	17
North Carolina:											
Gastonia	0	------	0	0	0	0	0	0	0	0	--------
Raleigh	0	------	0	0	4	2	0	3	0	0	25
Wilmington	0	------	0	0	1	1	0	0	0	1	15
Winston-Salem	1	------	0	1	5	0	0	0	0	0	14
South Carolina:											
Charleston	1	43	0	0	5	3	0	0	0	0	27
Columbia	0	------	0	0	11	0	0	5	0	0	67
Florence	0	------	0	0	2	1	0	0	0	0	11
Greenville	0	------	0	0	0	0	0	1	0	0	12
Georgia:											
Atlanta	6	8	1	1	15	18	0	4	0	0	108
Brunswick	1	1	1	1	0	1	0	0	0	0	5
Savannah	0	20	1	0	2	0	0	1	0	3	35
Florida:											
Miami	0	1	0	0	2	1	0	2	0	0	39
Tampa	2	1	1	0	2	0	0	3	0	0	24
Kentucky:											
Ashland	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Covington	0	2	0	1	5	1	0	2	0	1	21
Lexington	0	------	0	0	3	0	0	2	0	0	26
Louisville	2	6	0	1	15	7	0	2	1	9	75
Tennessee:											
Knoxville	2	------	1	0	9	1	0	2	0	0	58
Memphis	0	------	2	0	10	8	0	4	0	5	108
Nashville	0	------	2	0	15	3	0	1	0	1	85
Alabama:											
Birmingham	2	10	2	0	9	7	0	3	0	0	88
Mobile	1	2	0	0	2	1	0	1	0	0	28
Montgomery	2	------	--------	0	-------	1	0	-------	0	0	--------
Arkansas:											
Fort Smith	0	------	--------	0	-------	6	0	-------	0	0	--------
Little Rock	5	------	0	0	8	0	1	2	0	0	12
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	2	1	0	8
New Orleans	8	13	8	0	21	10	0	16	1	0	151
Shreveport	0	------	0	0	11	2	0	0	0	0	34
Oklahoma:											
Muskogee	0	------	0	1	0	0	0	0	0	0	--------
Oklahoma City	0	6	0	4	16	3	0	0	2	2	54
Tulsa	0	------	--------	1	-------	2	0	-------	0	0	--------
Texas:											
Dallas	2	1	1	3	11	5	0	3	0	2	74
Fort Worth	1	------	0	31	10	3	0	2	0	0	45
Galveston	1	------	0	0	0	0	0	0	0	0	17
Houston	16	------	0	1	8	1	1	4	0	3	110
San Antonio	1	------	1	0	11	0	0	8	1	0	78
Montana:											
Billings	0	1	0	0	3	2	0	0	0	0	18
Great Falls	0	------	0	0	3	0	0	0	0	0	6
Helena	0	------	0	0	1	7	0	0	0	0	6
Missoula	0	------	0	0	2	1	0	0	0	0	11
Idaho:											
Boise	0	------	1	0	3	3	0	1	0	0	15
Colorado:											
Colorado Springs	0	------	0	0	2	9	0	4	0	0	17
Denver	3	------	11	7	30	10	0	10	0	27	131
Pueblo	0	------	0	0	1	4	1	0	0	0	13
New Mexico:											
Albuquerque	0	------	0	0	5	5	0	4	3	0	15
Utah:											
Salt Lake City	0	------	0	3	4	7	0	1	0	2	32
Nevada:											
Reno	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Washington:											
Seattle	1	------	0	7	7	3	0	4	0	1	97
Spokane	0	8	0	0	5	9	1	1	0	0	40
Tacoma	0	------	0	0	4	2	0	1	0	0	22
Oregon:											
Portland	0	------	0	0	8	14	0	7	0	9	89
Salem	0	1	--------	1	-------	1	0	-------	0	2	--------
California:											
Los Angeles	20	28	0	10	22	20	1	22	0	46	334
Sacramento	2	1	0	0	9	10	0	6	0	0	39
San Francisco	1	8	1	2	12	13	0	8	1	5	212

City reports for week ended Jan. 2, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Maryland:			
Boston	1	1	0	Baltimore	1	1	0
New York:				District of Columbia:			
New York	2	1	0	Washington	2	0	0
Rochester	0	1	0	North Carolina:			
New Jersey:				Winston-Salem	1	0	0
Camden	0	0	1	Georgia:			
Newark	1	0	0	Atlanta	3	2	0
Pennsylvania:				Savannah	0	0	1
Philadelphia	1	0	0	Florida:			
Pittsburgh	2	2	0	Miami	0	0	1
Ohio:				Tennessee:			
Cincinnati	2	0	0	Memphis	0	2	1
Columbus	2	0	0	Nashville	1	0	0
Indiana:				Alabama:			
Indianapolis	0	1	0	Birmingham	2	1	0
Illinois:				Louisiana:			
Chicago	2	1	1	New Orleans	0	1	0
Michigan:				Texas:			
Detroit	2	1	0	Houston	1	0	0
Iowa:				Colorado:			
Davenport	1	0	0	Denver	1	0	0
Missouri:				California:			
Kansas City	1	1	0	Los Angeles	5	2	1
St. Joseph	1	0	0				
St. Louis	0	1	1				

Encephalitis, epidemic or lethargic.—Cases: Newark, 1; St. Louis, 1; New Orleans, 1.
Pellagra.—Cases: Charleston, S. C., 1; Atlanta, 1; Savannah, 2; Memphis, 1.
Typhus fever.—Cases: Charleston, S. C., 1; Atlanta, 1; Savannah, 5; Galveston, 1; Houston, 1.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—4 weeks ended December 19, 1936.—During the 4 weeks ended December 19, 1936, certain communicable diseases were reported in Habana, Cuba, as follows:

	Cases	Deaths		Cases	Deaths
Cerebrospinal meningitis	1	1	Poliomyelitis	[1] 7	
Diphtheria	15	1	Tuberculosis	16	1
Malaria	[1] 89		Typhoid fever	[1] 31	1

[1] Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended December 12, 1936.—During the 4 weeks ended December 12, 1936, certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		3		10		2	15
Chicken pox			1				1
Diphtheria		2		1	2	2	7
Leprosy		1	1	2		15	19
Malaria	107	80	40	163	268	847	1,535
Measles	19					1	20
Poliomyelitis		2	1				3
Tuberculosis	10	7	37	20	15	24	113
Typhoid fever	19	29	6	48	6	40	148
Yaws						1	1

EGYPT

Infectious diseases—First quarter 1936.—During the first quarter of 1936, certain infectious diseases were reported in Egypt, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	14	2	Mumps	385	3
Cerebrospinal fever	54	39	Plague	44	35
Chicken pox	574	4	Puerperal septicemia	99	79
Diphtheria	332	150	Rabies		7
Dysentery	336	69	Scarlet fever	17	
Epidemic jaundice	2	1	Tetanus	84	48
Erysipelas	996	181	Tuberculosis (pulmonary)	1,101	627
Influenza	1,743	147	Typhoid fever	668	124
Leprosy	39	17	Typhus fever	1,171	131
Lethargic encephalitis	1		Undulant fever	4	1
Malaria	768	4	Whooping cough	357	22
Measles	1,426	347			

Vital statistics—First quarter 1936.—Following are vital statistics for the first quarter of 1936 in all places in Egypt having a health bureau:

Population	4,710,500	Deaths per 1,000 population	22.9
Live births	56,600	Deaths from diarrhea and enteritis under 2 years	3,802
Births per 1,000 population	48.1	Infant mortality per 1,000 births	124
Stillbirths	1,025		
Total deaths	27,022		

FINLAND

Communicable diseases—November 1936.—During the month of November 1936, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	577	Poliomyelitis	15
Dysentery	1	Scarlet fever	1,130
Influenza	1,929	Typhoid fever	27
Lethargic encephalitis	1	Undulant fever	1
Paratyphoid fever	38		

IRISH FREE STATE

Vital statistics—Third quarter 1936.—The following statistics for the Irish Free State for the quarter ended September 30, 1936, are taken from the Quarterly Return of Marriages, Births, and Deaths, issued by the Registrar General, and are provisional:

	Number	Rates per 1,000 population		Number	Rates per 1,000 population
Marriages	4,228	5.7	Deaths from—Contd.		
Births	14,851	20.0	Influenza	61	.08
Total deaths	8,667	11.7	Measles	35	
Deaths under 1 year of age	885	(1)	Puerperal septicemia	16	[2] 1.08
Deaths from:			Scarlet fever	35	
Cancer	792	1.07	Tuberculosis (all forms)	765	1.03
Diarrhea and enteritis (under 2 years of age)	191		Typhoid fever	18	
Diphtheria	67		Whooping cough	45	

[1] Deaths under 1 year of age per 1,000 births, 60.
[2] Per 1,000 births.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for December 25, 1936, pages 1803-1815. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued January 29, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Indochina—Cochinchina—Bentre.—During the week ended January 2, 1937, 1 case of plague was reported in Bentre, Cochinchina, Indochina.

Peru.—During the month of November 1936, 33 cases of plague with 21 deaths were reported in Peru, as follows: Department of Cajamarca, 9 cases, 7 deaths; Department of Lambayeque, 3 cases; Department of Libertad, 19 cases, 13 deaths; Department of Lima, 2 cases, 1 death.

Smallpox

China—Canton.—During the week ended December 5, 1936, 1 case of smallpox was reported in Canton, China.

Typhus fever

Sudan (Anglo-Egyptian)—Geissan Region.—During the week ended December 19, 1936, 8 cases of typhus fever were reported in the Geissan Region, Anglo-Egyptian Sudan.

Yellow fever

Belgian Congo—Mangembo.—On December 22, 1936, 1 fatal suspected case of yellow fever was reported in Mangembo, Belgian Congo.

Nigeria—Uyo.—On December 17, 1936, 1 fatal suspected case of yellow fever was reported in Uyo, Nigeria.

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

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PREVALENCE OF INFLUENZA IN THE UNITED STATES

The number of reported cases of influenza exceeded the seasonal expectancy in all sections of the country during the weeks ended January 9 and January 16. The West South Central area reported a slight excess throughout the month of December; the Mountain, West North Central, East North Central, and Middle Atlantic sections reported more than the average number of cases for the week ended January 2; and the same sections have continued to report an excess of cases as compared with the seasonal expectancy during the first 2 weeks of January. The remainder of the country—that is, the Pacific, the East South Central, South Atlantic, and New England areas—also show an increase for the first half of January. In the country as a whole, approximately 30,000 cases in excess of seasonal expectancy were reported for the 2 weeks January 3–16, 1937. The latest preliminary reports show 35,953 cases for the week ended January 23, as compared with 23,270 for the preceding week.

The reports of cases of influenza are incomplete and vary in completeness in the various sections and States. During previous outbreaks, however, the maximum excess in the number of reported cases has usually preceded the maximum excess in the death rate from influenza and pneumonia by 1 or 2 weeks. Mortality from influenza and pneumonia (large cities) for the week ended January 2, the last week for which data are available, was decidedly higher than the seasonal expectancy in two sections, the Mountain and East North Central areas, where the rates were 521 and 264 per 100,000, respectively, as compared with an expectancy of approximately 175 and 100 per 100,000.

Mortality from all causes for the country as a whole (large cities) has been above normal for the 3 weeks ended January 2, 9, and 16, namely, 14.5, 15.9, and 15.5 per 100,000 as compared with 13.0, 12.8, and 12.3 for the corresponding weeks of 1934, the last preceding year that was relatively free from influenza. In the majority of cities in the West South Central, North Central, and Middle Atlantic sections,

the areas which reported excess numbers of cases of influenza for the week ended January 2, the number of deaths was slightly less for the second than for the first week in January. In a few cities in the Pacific, East South Central, South Atlantic, and New England sections, the number of deaths was slightly more for the week ended January 16 than for the week ended January 9. In the country as a whole, the number of deaths reported for the 86 large cities for the week ended January 16 was 11,154, slightly less than the number (11,403) for the preceding week.

Number of reported cases of influenza and death rate from influenza and pneumonia in each geographic area from Nov. 29, 1936 to Jan. 16, 1937

Region	Week ended—											
	Dec. 5	Dec. 12	Dec. 19	Dec. 26	Jan. 2	Jan. 9	Jan. 16	Dec. 5	Dec. 12	Dec. 19	Dec. 26	Jan. 2
	Number of reported cases of influenza in States							Death rate from influenza and pneumonia in groups of cities per 100,000 population				
All regions: [1]												
1936-37	1,701	1,971	2,225	2,088	3,933	12,145	23,270	117	137	141	159	222
1933-34 [2]	1,431	1,311	1,105	1,158	2,051	2,804	1,943	120	137	136	139	135
1931-32 [2]	987	873	602	1,092	1,211	1,550	1,931	93	96	106	114	110
New England:												
1936-37	4	2	10	10	21	108	1,102	136	113	157	188	215
1933-34	16	19	16	23	35	21	14	130	149	154	155	174
1931-32	11	24	15	20	25	93	217	99	93	72	116	101
Middle Atlantic:												
1936-37	19	44	43	46	513	1,901	1,271	94	103	113	122	169
1933-34	44	58	38	32	48	42	51	141	145	145	152	150
1931-32	22	21	20	32	51	44	40	107	99	116	122	108
East North Central:												
1936-37	90	129	249	381	1,001	1,467	2,445	83	101	124	173	264
1933-34	100	194	110	204	143	250	163	88	116	115	109	95
1931-32	125	13	25	76	80	180	106	57	62	69	69	82
West North Central:												
1936-37	71	60	97	80	263	4,535	7,907	144	170	170	170	193
1933-34	14	10	11	15	27	30	46	71	97	131	139	154
1931-32	8	9	9	10	20	14	12	109	94	118	109	121
South Atlantic:												
1936-37	424	509	706	368	621	921	1,103	201	296	182	257	313
1933-34	689	511	547	403	1,102	809	926	171	162	211	198	194
1931-32	530	507	322	540	586	577	652	128	152	152	154	144
East South Central:												
1936-37	165	311	207	113	286	568	1,656	161	202	242	175	282
1933-34	142	185	85	82	168	127	212	206	153	160	173	119
1931-32	58	44	52	101	99	250	138	120	133	138	126	145
West South Central:												
1936-37	729	663	652	896	503	1,220	2,076	258	298	218	179	249
1933-34	299	239	186	292	400	415	453	138	230	141	112	177
1931-32	99	81	41	77	159	133	158	83	142	111	159	155
Mountain:												
1936-37	75	78	164	124	692	1,058	3,599	220	168	282	291	521
1933-34	62	27	65	48	38	31	19	101	161	85	144	110
1931-32	11	13	5	10	25	24	303	148	131	122	217	296
Pacific:												
1936-37	124	175	97	70	93	361	2,094	106	120	134	106	136
1933-34	65	68	47	59	90	79	59	69	105	76	89	87
1931-32	123	161	113	226	168	235	305	81	96	144	136	96

[1] No reports were received from Mississippi, Nevada, up-State New York, Pennsylvania, or Virginia.
[2] Reported cases for the corresponding weeks of 1933-34 and 1931-32, 2 winters of average influenza incidence.

INFLUENZA IN EUROPE

Information received from the Health Section of the League of Nations under date of January 16, 1937, stated that influenza was spreading northward in England, with 311 deaths reported in London and 457 deaths in other cities for the week ended January 9; and it was said to appear likely that the epidemic would exceed that of 1933. Scotland and Ireland were only lightly touched; Sweden and Finland were practically unaffected; mortality had increased in Amsterdam and Copenhagen and declined in Berlin; while there was widespread prevalence of mild type in Poland, Czechoslovakia, and Spain during December 1936.

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE THIRD QUARTER AND THE FIRST 9 MONTHS OF 1936 [1]

By Dean K. Brundage, *Senior Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

This report presents a table and the analyses of the frequency of disability caused by sickness and nonindustrial accidents lasting 8 calendar days and longer among approximately 164,000 male industrial employees during the third quarter of 1935 and 1936, together with the cumulative rates for the first 9 months of each year, and the average for the first three quarters of 1931 to 1935, inclusive. As in the previous reports, the findings are the results of the cooperation of a group of sick-benefit associations which for a number of years have forwarded lists of the cases of sickness and nonindustrial accidents among their members to this office. These associations are located north of the Ohio and Potomac Rivers and east of the Mississippi River. Only new cases beginning during the periods specified and lasting 8 calendar days and longer are included. Disability from the venereal diseases and a few numerically unimportant causes are excluded. The disability rates for 1935 and 1936 were based on the experience of employees in the identical 29 associations, 24 of which were included in the rates for the 5-year period 1931–35.

Considering all causes of disability first, the record indicates that on the average about 91.8 out of 1,000 male employees were disabled by sickness and nonindustrial accidents for at least 8 calendar days

[1] The report for the second quarter and the first half of 1936 was published in the Public Health Reports for Dec. 4, 1936 (*51:* 1675–1677).

during the first three quarters of 1936, as compared with 87.0 for 1935, and 90.5 for 1931–35. To be sure, an excess of 4.8 cases, or of 1.3 cases per 1,000 males, based on the corresponding period of former years, may not appear significant; the excess, however, becomes significant when it is remembered that these cases lasted from 8 days to 52 weeks and that during these weeks expenses were borne by the associations as well as the employees.

Both respiratory and nonrespiratory diseases contributed to the indicated increase in sickness incidence in the third quarter of 1936 as compared with the same quarter of 1935.

Thus far in 1936 there have been reported more disabling nonindustrial accidents lasting over 1 week in each of the first three quarters of 1936 than in similar quarters of 1935.

It is gratifying to note in 1936 an unprecedentedly low third-quarter morbidity rate of new cases of tuberculosis of the respiratory system (0.7 cases per 1,000 years of exposure), which reduced the year-to-date rate from 1.0 per thousand in 1935 to 0.7 at the close of September 30, 1936. Indeed, the decline is so favorable that unless a large increase occurs during the 3 remaining months of the year, 1936 will yield new minimum sickness rates for this disease in this industrial group.

Pneumonia (all forms), with an excessive number of cases occurring in both the first and second quarters of 1936 as compared with former years, shows a rate for the third quarter of 1936 less than that for the same months of 1935. However, the frequency rate for the first three quarters of 1936 as a whole continued above the frequency for the same period of 1935 and the average for 1931–35.

In the nonrespiratory disease group some of the more serious diseases decreased in frequency. Diseases of the heart and arteries and nephritis, other genito-urinary diseases, neurasthenia and the like, occurred during the third quarter at lower rates than in the corresponding period of 1935.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter of 1936 compared with the same quarter of 1935, and in the first 9 months of 1936 as compared with the corresponding period of preceding years. (Male morbidity experience of industrial companies which reported their cases to the U. S. Public Health Service)*[1]

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men in—					Number of cases of disabilities in—				
	Third quarter of—		First 9 months of—			Third quarter of—		First 9 months of—		
	1936	1935	1936	1935	5 years, 1931–35	1936	1935	1936	1935	5 years, 1931-35
Sickness and nonindustrial injuries [2]	75.1	73.5	91.8	87.0	90.5	3,095	2,604	10,664	9,050	49,484
Nonindustrial injuries	13.5	12.8	11.8	10.9	11.7	555	454	1,368	1,135	6,409
Sickness [2]	61.6	60.7	80.0	76.1	78.8	2,540	2,150	9,296	7,915	43,075
Respiratory diseases	16.8	16.6	32.8	30.7	31.9	691	589	3,816	3,191	17,460
Bronchitis, acute and chronic (106)	2.6	2.8	4.7	3.8	3.5	106	99	551	388	1,904
Diseases of the pharynx and tonsils (115a)	4.3	3.9	5.0	5.2	4.9	177	140	576	542	2,696
Influenza and grippe (11)	4.3	4.1	14.8	13.8	16.2	178	144	1,721	1,436	8,843
Pneumonia, all forms (107–109)	.9	1.1	2.8	2.4	2.0	36	40	319	248	1,096
Tuberculosis of the respiratory system (23)	.7	.9	.7	1.0	1.0	28	31	87	107	555
Other respiratory diseases (104, 105, 110–114)	4.0	3.8	4.8	4.5	4.3	166	135	562	470	2,366
Nonrespiratory diseases	44.8	44.1	47.2	45.4	46.9	1,849	1,561	5,480	4,724	25,615
Diseases of the stomach, cancer excepted (117–118)	3.6	4.1	3.8	3.8	3.8	150	145	439	392	2,080
Diarrhea and enteritis (120)	1.8	1.6	1.4	1.2	1.2	75	55	161	121	634
Appendicitis (121)	4.5	4.2	4.5	3.9	3.7	187	149	516	408	2,049
Hernia (122a)	1.7	1.2	1.7	1.4	1.7	69	42	199	145	914
Other digestive diseases (115b, 116, 122b–129)	2.7	2.5	2.9	2.7	3.0	113	87	332	286	1,644
Rheumatic group, total	9.3	7.4	10.0	9.2	10.3	380	261	1,166	958	5,636
Rheumatism, acute and chronic (56, 57)	3.9	3.4	4.4	4.2	5.1	159	121	511	436	2,780
Diseases of the organs of locomotion (156b)	3.2	2.3	3.3	2.6	3.0	130	82	385	275	1,656
Neuralgia, neuritis, sciatica (87a)	2.2	1.7	2.3	2.4	2.2	91	58	270	247	1,200
Neurasthenia and the like (part of 87b)	.9	1.0	1.0	1.2	1.2	38	30	120	120	635
Other diseases of the nervous system (78–85, part of 87b)	1.1	1.1	1.2	1.2	1.3	44	41	139	129	737
Diseases of the heart and arteries, and nephritis (90–99, 102, 130–132)	2.9	3.9	3.6	4.0	3.9	121	137	417	417	2,117
Other genito-urinary diseases (133–138)	2.1	2.9	2.3	2.7	2.5	88	103	269	285	1,351
Diseases of the skin (151–153)	3.8	3.5	2.9	2.7	2.8	158	124	337	234	1,550
Infectious and parasitic diseases except influenza (1–10, 12–22, 24–33, 36–41)	1.5	2.1	2.6	2.8	2.5	61	73	304	287	1,381
Ill-defined and unknown causes (200)	3.1	2.4	2.8	2.2	2.1	128	87	324	220	1,140
All other diseases (45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	5.8	6.2	6.5	6.4	6.9	237	221	757	663	3,747
Average number of males covered in the record	163,918	140,627	154,767	139,115	146,206	163,918	140,627	154,767	139,115	146,206
Number of companies	29	29	29	29		29	29	29	29	

[1] In 1935 and 1936 the same companies are included. The rates for the third quarters of the years 1931 to 1935 include 24 of these companies, which employed an average of 115,250 men during these months, or 79 percent of the 146,206 men representing the sample population for the 5-year average.

[2] Exclusive of disability from the venereal diseases and a few numerically unimportant causes of disability.

REPORT ON MARKET-MILK SUPPLIES OF URBAN COMMUNITIES

Compliance of the Market-Milk Supplies of Urban Communities With the Grade A Pasteurized and Grade A Raw Milk Requirements of the Public Health Service Milk Ordinance and Code (as Shown by Ratings of 90 Percent or More Reported by the State Milk-Sanitation Authorities During the Period Jan. 1, 1935, to Dec. 31, 1936)

The accompanying list gives the seventh semiannual revision of the list of urban communities in which the pasteurized market milk is both produced and pasteurized in accordance with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code, and in which the raw market milk sold to the final consumer is produced in accordance with the Grade A raw milk requirements of said ordinance and code, as shown by ratings of 90 percent or more reported by State milk-sanitation authorities.

The primary reason for publishing such lists from time to time is to encourage the communities of the United States to attain and maintain a high level of excellence in the public health control of milk supplies.

It is emphasized that the Public Health Service does not intend to imply that all communities not on the list are not provided with high-grade milk supplies. Some communities which have high-grade milk supplies are not included because arrangements have not been made for the determination of their ratings by the State milk-sanitation authority. In other cases, the ratings which have been determined are now more than 2 years old and have therefore lapsed.

The rules under which a community is included in this list are as follows:

(1) All ratings must have been determined by the State milk-sanitation authority in accordance with the Public Health Service rating method, based upon the Grade A pasteurized milk and the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code.

(2) No community will be included in the list unless both its pasteurized-milk and its raw-milk ratings are 90 percent or more, provided that communities in which only raw milk is sold will be included if the raw-milk ratings are 90 percent or more.

(3) The rating used will be the latest rating submitted to the Public Health Service, but no rating will be used which is more than 2 years old.

(4) Occasional surprise checks will be made of the rating methods used by the State, and discounts will be applied if State ratings are found to be more than 5 percent too high.

Communities are urgently advised to bring their ordinances up to date at least every 5 years, since ratings will be made on the basis of later editions if those adopted locally are more than 5 years old.

Communities which are not now on the list should request the State milk-sanitation authority to determine their ratings and, if necessary, improve their status sufficiently to merit inclusion in the list.

Communities which are now on the list should not permit their ratings to lapse, as ratings more than 2 years old cannot be used.

Communities which have not yet adopted the Public Health Service Milk Ordinance should give thoughtful consideration to the advisability of doing so. It is obviously easier to satisfy the requirements upon which the rating method is based if these are included in the local legislation.

Communities which are enforcing the Public Health Service Milk Ordinance, but which have not yet been admitted to the list, should determine whether this has been the result of failure to enforce the ordinance strictly or failure to bring the ordinance up to date.

State milk-sanitation authorities which are not now equipped to determine municipal ratings are urged, in fairness to their communities, to equip themselves as soon as possible. The personnel required is small, as in most States one milk specialist is sufficient for the work.

The inclusion of a community in this list means that the pasteurized milk sold in the community, if any, is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A pasteurized milk is 90 percent or more and that, similarly, the raw milk sold in the community, if any, so nearly meets the requirements that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A raw milk is 90 percent or more. However, high-grade pasteurized milk is safer than high-grade raw milk because of the added protection of pasteurization. To secure this added protection, those who are dependent on raw milk can pasteurize the milk at home in the following simple manner: Place the milk in an aluminum vessel on a hot flame and heat to 155° F., stirring constantly; then immediately set the vessel in cold water and continue stirring until cool.

TABLE 1.—*Communities in which all market milk is pasteurized. In these communities market milk complies with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized milk ratings of 90 percent or more*

Community	Percentage of milk pasteurized	Date of rating
MINNESOTA		
Winona	100	Oct. 30, 1936
NORTH CAROLINA		
Greenville	100	Dec. 16, 1936
Princeville	100	Apr. 18, 1935
Tarboro	100	Nov. 12, 1936

TABLE 2.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw-milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw-milk ratings, respectively, of 90 percent or more*

[NOTE.—All milk should be pasteurized or boiled before it is consumed, either commercially or at home. See text for home method]

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
ALABAMA			NORTH CAROLINA—con.		
Huntsville	82	Dec. 16, 1936.	Morehead City	61	Dec. 3, 1936.
Montgomery	27	Dec. 4, 1936.	Rocky Mount	35	Dec. 19, 1936.
Tuscaloosa	77	Dec. 13, 1935.	OKLAHOMA		
ARIZONA			Bartlesville	32	Mar. 20, 1936.
Flagstaff	32	February 1935.	Blackwell	48	June 3, 1936.
Tucson	85	June 21, 1935.	Muskogee	59	January 1936.
Yuma	39	June 14, 1935.	Oklahoma City	70	December 1935.
ARKANSAS			Tulsa	73	January 1936.
Eldorado	32	October 1936.	OREGON		
Little Rock	33	November 1936.	Portland	77	October 1936.
Pine Bluff	32	June 1936.	TENNESSEE		
Texarkana	18	Feb. 20, 1936.	Bristol	48	May 8, 1935.
FLORIDA			Clarksville	42	Mar. 19, 1936.
Coral Gables	89	July 1, 1936.	Memphis	77	July 11, 1936.
Miami	91	Do.	Union City	33	May 21, 1936.
KANSAS			TEXAS		
Junction City	31	June 1936.	Abilene	70	Aug. 7, 1935.
Lawrence	48	May 1936.	Amarillo	61	June 29, 1935.
Topeka	59	Do.	Austin	35	Dec. 19, 1935.
Wichita	58	December 1935.	Ballinger	50	Mar. 2, 1936.
KENTUCKY			Beaumont	57	June 1936.
Ashland	86	June 1936.	Big Spring	27	Aug. 5, 1935.
Bowling Green	37	May 1936.	Brownwood	17	June 26, 1936.
Glasgow	62	Do.	Corsicana	4	Mar. 26, 1935.
Henderson	34	Do.	Dallas	73	Dec. 7, 1935.
Louisville	96	March 1936.	Denton	64	Mar. 4, 1936.
MINNESOTA			El Paso	71	July 31, 1935.
Albert Lea	97	Oct. 23, 1936.	Fort Worth	83	Feb. 23, 1935.
Little Falls	55	Oct. 23, 1935.	Gainesville	46	Sept. 6, 1935.
MISSISSIPPI			Galveston	75	August 1936.
Greenville	26	Aug. 29, 1935.	Houston	83	October 1935.
McComb	8	Jan. 9, 1936.	Kerrville	72	May 8, 1936.
Vicksburg	41	June 20, 1935.	Laredo	39	December 1935.
MISSOURI			Livingston	20	March 1936.
Columbia	41	Mar. 3, 1936.	Lubbock	32	July 10, 1935.
Hannibal	31	May 29, 1936.	Midland	31	May 6, 1936.
Moberly	49	May 1, 1936.	Port Arthur	38	June 1936.
Sedalia	20	Apr. 10, 1936.	San Angelo	58	Apr. 8, 1936.
NEW MEXICO			San Antonio	64	September 1935.
Las Cruces	53	Nov. 13, 1935.	Seguin	5	March 1936.
NORTH CAROLINA			Sweetwater	56	June 23, 1936.
Clinton	29	Dec. 17, 1936.	Texarkana	20	May 1935.
Fayetteville	52	Sept. 30, 1936.	Tyler	60	January 1936.
Hope Mills	40	Do.	Victoria	13	February 1936.
Kinston	16	Apr. 10, 1936.	Waco	31	Sept. 20, 1935.
			Wichita Falls	79	May 26, 1936.
			VIRGINIA		
			Bristol	48	May 8, 1935.
			WASHINGTON		
			Vancouver	31	Oct. 9, 1936.
			Walla Walla	54	May 6, 1936.
			WEST VIRGINIA		
			Huntington	43	Aug. 5, 1936.

TABLE 3.—*Communities in which no market milk is pasteurized, but in which the raw market milk complies with the Grade A raw-milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by raw-milk ratings of 90 percent or more*

NOTE.—All milk should be pasteurized or boiled before it is consumed, either commercially or at home. See text for home method]

Community	Date of rating
ALABAMA	
Demopolis	Nov. 22, 1935.
Scottsboro	Dec. 31, 1935.
Stevenson	Do.
Sylacauga	Dec. 6, 1935.
Talladega	Do.
York	Nov. 20, 1935.
KANSAS	
Horton	Sept. 1, 1936.
Sabetha	Sept. 25, 1936.
MISSISSIPPI	
Brookhaven	May 17, 1935.
Durant	May 13, 1935.
Lexington	Do.
Magnolia	Jan. 10, 1936.
Ocean Springs	Sept. 5, 1935.
Pascagoula	Do.
Picayune	June 5, 1935.
Yazoo City	May 14, 1935.
MISSOURI	
Ash Grove	July 9, 1936.
NEW MEXICO	
Clayton	June 20, 1935.
Deming	Mar. 26, 1935.
NORTH CAROLINA	
Angier	May 18, 1936.
Buies Creek	Nov. 9, 1936.
Cary	Apr. 23, 1936.
Coats	May 18, 1936.
NORTH CAROLINA—continued	
Dunn	May 18, 1936.
Erwin	Do.
Fairmont	May 28, 1936.
Lillington	Nov. 9, 1936.
Lumberton	May 28, 1936.
Pinehurst	Nov. 7, 1936.
Raeford	May 29, 1936.
Red Springs	May 28, 1936.
Roanoke Rapids	Apr. 6, 1936.
Southern Pines	Nov. 11, 1936.
Southport	Oct. 2, 1935.
Sylva	Sept. 23, 1935.
Washington	Sept. 26, 1935.
Whiteville	Dec. 18, 1936.
Williamston	Nov. 19, 1936.
TENNESSEE	
Alcoa	July 3, 1935.
Dyersburg	Sept. 3, 1936.
TEXAS	
Brenham	June 11, 1936.
Bryan	May 1936.
Canyon	Apr. 13, 1936.
Childress	Apr. 17, 1936.
Colorado	July 19, 1935.
Commerce	Apr. 24, 1936.
Crockett	May 1936.
Del Rio	June 12, 1936.
Jacksonville	January 1936.
WASHINGTON	
Camas	Oct. 9, 1936.

DEATHS DURING WEEK ENDED JANUARY 9, 1937

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 9, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:[1]		
Total deaths	11,401	10,155
Average for 3 prior years	9,623	
Deaths under 1 year of age	719	614
Average for 3 prior years	613	
Data from industrial insurance companies:		
Policies in force	69,168,624	67,874,415
Number of death claims	14,283	13,545
Death claims per 1,000 policies in force, annual rate	10.8	10.4

[1] The use of rates has been discontinued, principally owing to the fact that no dependable population estimates are available for intercensus periods.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 16, 1937, and January 18, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 16, 1937, and Jan. 18, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936
New England States:								
Maine			19	4	90	243	0	0
New Hampshire		1	66		22	46	0	0
Vermont					1	85	0	0
Massachusetts	7	20			1,052	370	2	5
Rhode Island		1	22		74	159	1	2
Connecticut	5	5	995	18	203	68	0	1
Middle Atlantic States:								
New York	55	40	[1] 926	[1] 22	300	930	20	18
New Jersey	18	16	845	15	445	42	4	5
Pennsylvania	39	28			135	209	4	1
East North Central States:								
Ohio	55	33	352	75	70	85	11	8
Indiana	25	29	283	44	12	34	4	2
Illinois	36	50	353	57	13	41	11	11
Michigan	21	16	97	6	69	27	5	2
Wisconsin	7	5	1,360	45	19	114	3	0
West North Central States:								
Minnesota	8	2	88	1	31	122	2	1
Iowa	2	15	3,152	9	7	3	1	5
Missouri	19	28	818	212	7	33	2	5
North Dakota	2	7	232	17		8	1	0
South Dakota		1	412		5	28	0	1
Nebraska		8	99	2	5	27	0	2
Kansas	10	10	3,106	7	9	15	1	3
South Atlantic States:								
Delaware	5	2	22	1	117	137	0	0
Maryland [2]	15	13	176	27	291	143	12	8
District of Columbia	19	26	107	5	23	6	2	6
Virginia	39	31			71	69	10	2
West Virginia	14	20	72	148	17	13	4	4
North Carolina	47	31	79	13	98	21	6	2
South Carolina [3]	14	1	652	480	62	5	4	2
Georgia [3]	8	13		284			3	3
Florida	9	13	12	5		1	3	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 16, 1937, and Jan. 18, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936
East South Central States:								
Kentucky	9	20	399	24	84	55	16	7
Tennessee	18	22	873	200	4	9	2	16
Alabama [3]	20	21	384	313	3	20	7	1
Mississippi [2]	9	5					1	4
West South Central States:								
Arkansas	6	15	245	63		5	0	2
Louisiana	11	31	283	26	122	15	2	2
Oklahoma [4]	8	15	564	191	13		2	10
Texas [3]	67	71	984	413	298	183	4	33
Mountain States:								
Montana	1		2,796	8	1	7	0	1
Idaho	2	1	259	1	55	59	0	0
Wyoming		1			1		0	0
Colorado	5	10	[5] 86		4	5	2	5
New Mexico	4		72	6	35	1	1	1
Arizona	2	11	386	145	136	6	1	1
Utah [2]	1				83	4	1	0
Pacific States:								
Washington	3	5	26		34	112	0	2
Oregon	2	1	825	27	5	386	0	1
California	29	56	1,243	93	71	933	3	9
Total	676	750	23,270	3,007	4,287	4,834	153	197
First 2 weeks of year	1,353	1,566	35,415	5,568	8,243	10.087	301	371

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936
New England States:								
Maine	0	3	16	16	0	0	4	1
New Hampshire	0	0	23	7	0	0	0	0
Vermont	0	0	3	19	0	0	0	0
Mssachusetts	0	0	260	328	0	0	2	1
Rhode Island	0	0	60	25	0	0	0	0
Connecticut	0	0	77	59	0	0	0	1
Middle Atlantic States:								
New York	0	5	777	824	22	0	7	6
New Jersey	0	1	164	226	0	0	3	1[illegible]
Pennsylvania	1	2	590	368	0	0	16	8
East North Central States:								
Ohio	5	1	433	390	20	3	6	6
Indiana	0	0	174	312	5	3	0	1
Illinois	0	5	513	640	14	8	3	5
Michigan	0	0	613	317	1	1	3	2
Wisconsin	1	0	288	651	9	22	0	0
West North Central States:								
Minnesota	1	0	184	377	18	28	1	2
Iowa	1	0	156	221	18	15	0	6
Missouri	0	1	193	263	60	4	0	8
North Dakota	0	0	35	94	27	5	0	0
South Dakota	0	0	79	73	21	14	0	0
Nebraska	0	0	67	204	3	44	0	0
Kansas	1	0	296	218	20	30	2	5
South Atlantic States:								
Delaware	0	0	9	15	0	0	0	0
Maryland [2]	0	0	104	81	0	0	1	5
District of Columbia	0	0	22	28	0	0	1	6
Virginia	0	1	50	67	1	0	7	7
West Virginia	0	1	60	55	0	0	2	2
North Carolina	1	0	63	45	0	1	7	4
South Carolina [3]	1	0	11	5	0	1	2	0
Georgia [3]	2	0	13	21	0	0	2	0
Florida	0	0	6	15	0	0	1	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 16, 1937, and Jan. 18, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan. 18, 1936	Week ended Jan. 16, 1937	Week ended Jan 18, 1936
East South Central States:								
Kentucky	0	0	54	81	2	0	9	11
Tennessee	0	1	32	38	0	0	5	3
Alabama [3]	0	0	10	8	0	2	2	2
Mississippi [2]	1	0	17	10	0	0	2	1
West South Central States:								
Arkansas	1	0	18	19	0	2	2	1
Louisiana	1	0	7	30	1	2	9	2
Oklahoma [4]	2	0	27	60	3	1	2	2
Texas [3]	2	0	125	120	12	2	22	9
Mountain States:								
Montana	0	0	58	219	13	31	0	0
Idaho	1	0	19	86	15	2	0	0
Wyoming	0	0	14	78	1	0	0	0
Colorado	0	0	30	142	7	11	0	0
New Mexico	1	1	25	61	0	0	7	3
Arizona	0	0	11	41	0	0	2	0
Utah [2]	0	0	20	121	0	0	0	0
Pacific States:								
Washington	1	0	46	104	6	27	2	1
Oregon	0	0	63	50	12	2	0	0
California	3	1	355	398	4	2	5	2
Total	27	23	6,270	7,630	315	263	139	113
First 2 weeks of year	48	45	11,437	14,806	591	516	276	234

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 16, 1937, 29 cases, as follows: South Carolina, 1; Georgia, 15; Alabama, 3; Texas, 10.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Exclusive of Denver.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1936										
Alabama	6	112	441	167	8	9	8	92	0	21
Florida	19	49	20	55	14	1	3	41	0	3
Idaho	2	2	21		388		0	162	5	6
Indiana	14	91	205		42		0	649	12	8
Maine	2	11	24		143		1	84	0	3
New Jersey	9	66	105	1	734		1	463	0	4
Pennsylvania	29	235		3	212		4	1,935	0	75
South Carolina		142	1,350	349	89	33	1	28	0	10

December 1936

	Cases
Anthrax:	
New Jersey	4
Chicken pox:	
Alabama	94
Florida	51
Idaho	239
Indiana	520
Maine	377
New Jersey	1,604
Pennsylvania	4,250
South Carolina	50
Conjunctivitis:	
Idaho	5
Dengue:	
South Carolina	3
Diarrhea:	
South Carolina	147
Dysentery:	
Alabama (amoebic)	5
Florida	5
New Jersey (bacillary)	1
Pennsylvania (bacillary)	2
Encephalitis, epidemic or lethargic:	
Alabama	1
New Jersey	5
Pennsylvania	3
German measles:	
Alabama	2
Idaho	5
Maine	8
New Jersey	75
Pennsylvania	54
South Carolina	1
Hookworm disease:	
South Carolina	33

December 1936—Continued

	Cases
Impetigo contagiosa:	
Idaho	8
Lead poisoning:	
Pennsylvania	1
Mumps:	
Alabama	65
Florida	39
Idaho	47
Indiana	51
Maine	409
New Jersey	601
Pennsylvania	1,391
South Carolina	14
Ophthalmia neonatorum:	
Alabama	2
New Jersey	13
Pennsylvania	1
South Carolina	4
Rabies in animals:	
Alabama	87
Indiana	61
New Jersey	1
South Carolina	22
Rabies in man:	
Alabama	1
Pennsylvania	1
Rocky Mountain spotted fever:	
Idaho (delayed report)	1
Scabies:	
Idaho	17
Septic sore throat:	
Idaho	3
Indiana	2

December 1936—Continued

	Cases
Tetanus:	
Alabama	4
South Carolina	1
Trachoma:	
Pennsylvania	1
Trichinosis:	
New Jersey	2
Tularaemia:	
Alabama	1
Indiana	13
New Jersey	2
Pennsylvania	8
South Carolina	1
Typhus fever:	
Alabama	43
Florida	3
South Carolina	5
Undulant fever:	
Alabama	2
New Jersey	11
Pennsylvania	9
South Carolina	1
Vincent's infection:	
Idaho	4
Maine	5
South Carolina	2
Whooping cough:	
Alabama	32
Florida	20
Idaho	9
Indiana	152
Maine	141
New Jersey	678
Pennsylvania	2,403
South Carolina	71

CASES OF VENEREAL DISEASES REPORTED FOR NOVEMBER 1936

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	870	3.07	305	1.08
Arizona	35	.91	64	1.66
Arkansas [1]	122	.61	83	.42
California	1,377	2.44	1,447	2.57
Colorado	41	.39	28	.26
Connecticut	170	.99	127	.74
Delaware	142	5.55	37	1.45
District of Columbia	147	2.47	177	2.98
Florida	284	1.76	73	.45
Georgia	915	2.74	607	1.81
Idaho	33	.69	62	1.29
Illinois	1,579	2.02	1,301	1.66
Indiana	135	.39	115	.34
Iowa [1]	110	.43	131	.52
Kansas	84	.45	66	.36
Kentucky	186	.65	248	.87
Louisiana	131	.62	90	.42
Maine	36	.43	45	.53
Maryland	823	4.93	269	1.61
Massachusetts	469	1.07	488	1.12
Michigan	501	1.07	556	1.19
Minnesota	257	.98	297	1.13
Mississippi	1,463	7.46	2,082	10.62
Missouri	372	.95	209	.53
Montana [1]	39	.73	41	.77
Nebraska	31	.23	54	.40
Nevada [2]				

See footnotes at end of table.

Reports from States—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
New Hampshire	13	.26	15	.30
New Jersey	552	1.29	291	.68
New Mexico	65	1.62	56	1.39
New York	6,806	5.28	1,934	1.50
North Carolina	1,425	4.17	308	.90
North Dakota	17	.24	48	.69
Ohio [1]	943	1.41	345	.51
Oklahoma [1]	210	.84	133	.53
Oregon	84	.83	162	1.61
Pennsylvania [3]	235	.23	152	.15
Rhode Island	78	1.15	73	1.07
South Carolina [1]	65	.32	71	.35
South Dakota	11	.16	26	.39
Tennessee [1]	534	1.84	253	.87
Texas	349	.57	260	.43
Utah [2]				
Vermont	13	.34	34	.90
Virginia	393	1.49	223	.85
Washington	199	1.22	301	1.84
West Virginia	218	1.20	140	.77
Wisconsin [4]	29	.10	185	.64
Wyoming [2]				
Total	22,590	1.78	14,009	1.11

Reports from cities of 200,000 population or over

Akron, Ohio	13	0.48	19	0.70
Atlanta, Ga.[5]				
Baltimore, Md	471	5.71	162	1.96
Birmingham, Ala	138	4.89	69	2.44
Boston, Mass	178	2.25	191	2.42
Buffalo, N. Y	125	2.11	72	1.22
Chicago, Ill	821	2.30	782	2.19
Cincinnati, Ohio	54	1.16	48	1.03
Cleveland, Ohio	205	2.20	69	.74
Columbus, Ohio	34	1.11	44	1.44
Dallas, Tex	96	3.31	73	2.52
Dayton, Ohio	87	4.14	17	.81
Denver, Colo	47	1.58	27	.91
Detroit, Mich.[5]				
Houston, Tex.[6]	177	5.29	42	1.25
Indianapolis, Ind	30	.80	38	1.01
Jersey City, N. J.[5]				
Kansas City, Mo	57	1.35	17	.40
Los Angeles, Calif	305	2.76	358	2.50
Louisville, Ky	143	4.41	46	1.42
Memphis, Tenn	172	6.44	54	2.02
Milwaukee, Wis.[5]				
Minneapolis, Minn	57	1.17	114	2.34
Newark, N. J	219	4.73	124	2.68
New Orleans, La.[5]				
New York, N. Y	5,335	7.30	1,203	1.65
Oakland, Calif	60	1.98	50	1.65
Omaha, Nebr	13	.59	13	.59
Philadelphia, Pa	249	1.25	52	.23
Pittsburgh, Pa.[5]				
Portland, Oreg.[5]				
Providence, R. I	49	1.89	51	1.97
Rochester, N. Y	51	1.51	59	1.75
St. Louis, Mo	216	2.58	82	.98
St. Paul, Minn	27	.96	47	1.67
San Antonio, Tex.[5]				
San Francisco, Calif	159	2.37	150	2.24
Seattle, Wash	107	2.82	184	4.85
Syracuse, N. Y	80	3.67	83	3.81
Toledo, Ohio	53	1.74	29	.95
Washington, D. C.[7]	147	2.96	177	3.56

[1] Incomplete.
[2] Not reporting.
[3] Includes only those cases that enter the clinics conducted by the State department of health.
[4] Only cases of syphilis in the infectious stage are reported.
[5] No report for current month.
[6] Reported by the Jefferson Davis Hospital; physicians are not required to report venereal diseases.
[7] Reported by the Social Hygiene Clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 9, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	1	3	6	0	1	1	8	32
New Hampshire:											
Concord	0	------	0	0	5	0	0	0	0	0	13
Manchester	0	------	1	0	4	0	0	0	0	0	28
Nashua	0	------	------	0	1	0	0	------	0	0	------
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	4
Burlington	0	------	2	0	0	1	0	0	0	1	10
Rutland	0	------	0	0	2	0	0	0	0	0	9
Massachusetts:											
Boston	3	------	1	5	43	71	0	9	0	199	258
Fall River	0	------	0	2	9	2	0	2	0	2	46
Springfield	0	------	0	6	2	10	0	1	0	12	47
Worcester	0	------	1	155	10	1	0	1	0	23	62
Rhode Island:											
Pawtucket	0	------	0	5	0	4	0	0	0	0	20
Providence	1	------	2	53	13	32	0	1	0	29	95
Connecticut:											
Bridgeport	1	9	2	113	2	4	0	1	0	4	44
Hartford	0	5	0	0	4	9	0	3	0	2	41
New Haven	0	19	0	2	3	6	0	0	1	4	36
New York:											
Buffalo	2	3	3	94	37	25	0	2	0	29	194
New York	58	1,783	61	73	408	252	0	86	4	93	2,167
Rochester	0	------	1	0	8	4	0	2	0	15	75
Syracuse	0	------	0	23	4	29	0	1	0	42	50
New Jersey:											
Camden	6	7	1	0	2	3	0	1	0	9	31
Newark	0	22	0	146	14	15	0	6	0	28	117
Trenton	0	2	1	0	4	3	0	4	1	0	42
Pennsylvania:											
Philadelphia	4	18	5	6	51	128	0	21	2	134	521
Pittsburgh	2	31	9	1	58	41	0	11	1	43	267
Reading	0	------	1	1	2	4	0	2	0	62	42
Scranton	0	------	------	0	------	4	0	------	0	0	------
Ohio:											
Cincinnati	1	45	28	7	29	9	0	3	0	4	195
Cleveland	7	83	2	1	28	55	0	8	0	68	225
Columbus	4	2	2	2	15	10	0	5	0	4	110
Toledo	1	4	4	3	12	14	0	4	0	42	92
Indiana:											
Anderson	0	------	0	1	2	18	2	0	0	3	12
Fort Wayne	0	------	0	0	8	3	0	0	0	0	47
Indianapolis	2	------	11	4	41	17	0	5	0	10	158
Muncie	1	------	0	0	2	2	0	0	0	0	11
South Bend	0	------	3	0	3	2	0	0	0	5	23
Terre Haute	0	------	0	0	0	4	0	0	0	0	19
Illinois:											
Chicago	8	216	52	5	149	216	1	50	1	68	970
Elgin	0	------	3	0	6	0	0	0	0	26	21
Moline	0	------	0	0	8	0	0	0	0	2	20
Springfield	2	------	0	0	4	1	0	0	0	8	13
Michigan:											
Detroit	8	87	26	4	82	235	0	14	0	97	399
Flint	2	------	0	2	8	11	0	1	0	14	28
Grand Rapids	0	------	0	1	0	7	0	0	1	29	28
Wisconsin:											
Kenosha	0	21	1	0	1	2	0	0	0	1	17
Madison	0	------	0	1	0	10	0	0	0	5	25
Milwaukee	2	30	23	2	27	42	0	3	0	19	198
Racine	0	4	4	1	2	9	1	0	0	0	18
Superior	3	------	0	0	0	1	0	0	0	8	5
Minnesota:											
Duluth	0	------	0	0	2	12	0	0	0	4	26
Minneapolis	2	------	12	3	30	15	0	0	0	7	170
St. Paul	0	2	2	3	15	15	0	3	0	23	82
Iowa:											
Cedar Rapids	0	------	------	1	------	1	0	------	0	2	------
Davenport	0	------	------	0	------	4	0	------	0	0	------
Des Moines	1	348	------	0	------	11	1	------	0	1	51
Sioux City	0	1,096	------	0	------	14	1	------	0	0	------
Waterloo	0	------	------	1	------	3	0	------	0	21	------

City reports for week ended Jan. 9, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Missouri:											
Kansas City	2	1	4	0	26	31	0	8	0	11	131
St. Joseph	3	------	0	0	0	3	24	0	0	0	12
St. Louis	13	19	12	5	37	48	0	10	0	39	306
North Dakota:											
Fargo	0	------	0	------	1	1	0	0	0	0	6
Grand Forks	0	------	------	0	------	0	1	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	10
South Dakota:											
Aberdeen	0	------	------	0	------	2	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	7
Nebraska:											
Omaha	0	------	1	0	30	12	0	0	0	7	97
Kansas:											
Lawrence	0	10	0	0	1	2	0	0	0	0	4
Topeka	0	------	0	0	1	1	0	0	0	0	13
Wichita	0	------	0	1	5	7	1	1	0	1	32
Delaware:											
Wilmington	1	------	0	178	4	1	0	0	0	0	37
Maryland:											
Baltimore	5	44	5	200	30	29	0	9	1	141	287
Cumberland	0	------	0	0	4	4	0	0	0	4	19
Frederick	0	------	0	0	0	0	0	0	0	0	4
Dist. of Columbia:											
Washington	17	15	6	16	33	18	0	20	0	44	222
Virginia:											
Lynchburg	1	------	1	0	3	1	0	0	0	0	13
Norfolk	2	------	0	0	4	2	0	1	0	0	16
Richmond	0	------	1	0	14	5	0	0	0	0	68
Roanoke	1	------	1	0	4	1	0	1	0	2	19
West Virginia:											
Charleston	2	------	0	0	7	3	0	0	0	1	31
Huntington	0	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	0	0	3	0	0	1	0	1	27
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	1	------	0	0	1	0	0	0	0	0	11
Winston-Salem	2	2	0	1	5	0	0	0	2	0	23
South Carolina:											
Charleston	1	69	0	0	4	1	0	2	0	0	28
Columbia	0	------	0	0	2	0	0	0	0	0	8
Greenville	0	------	0	0	1	0	0	0	0	0	8
Georgia:											
Atlanta	3	64	1	0	18	4	0	3	1	0	106
Brunswick	0	------	0	0	1	1	0	0	0	6	5
Savannah	0	18	0	1	3	0	0	1	0	0	42
Florida:											
Miami	0	------	0	0	4	0	0	4	0	0	54
Tampa	0	------	0	0	3	3	0	1	0	1	31
Kentucky:											
Covington	0	------	0	0	8	4	0	1	0	0	22
Lexington	0	------	0	0	5	0	0	2	0	0	19
Louisville	0	49	3	1	24	7	0	3	1	35	99
Tennessee:											
Knoxville	0	80	1	0	10	4	0	2	0	0	44
Memphis	1	------	0	1	11	6	0	7	0	3	85
Nashville	4	------	6	0	14	2	0	0	0	0	63
Alabama:											
Birmingham	5	12	6	0	18	5	0	5	1	2	100
Mobile	3	------	0	0	3	0	0	2	0	0	27
Montgomery	1	6	------	0	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	2	------	------	0	------	6	0	------	0	0	------
Little Rock	0	5	0	0	2	3	0	2	0	0	5
Louisiana:											
Lake Charles	1	------	0	0	2	0	0	0	0	0	7
New Orleans	7	8	8	1	17	10	0	10	1	1	146
Shreveport	0	------	0	1	7	0	0	1	1	0	37
Oklahoma:											
Tulsa	0	------	------	0	------	0	0	------	0	0	------
Texas:											
Dallas	2	2	2	3	15	8	0	2	1	3	87
Fort Worth	1	------	1	112	9	2	0	1	1	1	45
Galveston	0	1	0	0	5	5	0	0	0	0	17
Houston	5	------	1	0	19	4	0	6	0	0	87
San Antonio	5	1	0	0	10	0	0	4	0	0	68

City reports for week ended Jan. 9, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Montana:											
Billings	0	------	1	0	1	1	0	0	0	0	12
Great Falls	0	------	0	0	1	2	0	0	0	0	11
Helena	0	------	0	1	1	9	1	0	0	0	4
Missoula	0	100	0	0	1	3	0	0	0	0	7
Idaho:											
Boise	0	------	0	0	1	0	0	0	0	0	6
Colorado:											
Colorado Springs	0	------	0	1	5	3	0	0	0	0	21
Denver	3	------	44	2	31	10	0	7	0	30	202
Pueblo	0	9	1	0	2	4	3	1	0	0	13
New Mexico:											
Albuquerque	1	2	0	0	5	3	0	5	0	0	15
Utah:											
Salt Lake City	1	1	1	21	7	11	0	1	0	5	47
Washington:											
Seattle	1	------	2	8	6	5	1	3	0	9	101
Spokane	0	5	2	0	9	1	0	0	0	1	36
Tacoma	0	------	0	0	4	5	0	0	0	0	36
Oregon:											
Portland	1	10	1	1	21	4	0	1	2	9	118
Salem	0	6	------	1	------	0	0	------	0	2	------
California:											
Los Angeles	14	68	3	6	53	40	2	21	0	60	489
Sacramento	0	1	0	7	7	27	1	3	0	3	------
San Francisco	0	24	1	4	11	21	0	16	0	21	194

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	2	1	0
Rhode Island:			
Providence	1	1	0
New York:			
Buffalo	1	1	0
New York	4	3	1
New Jersey:			
Newark	3	0	0
Pennsylvania:			
Philadelphia	3	1	0
Reading	1	0	0
Ohio:			
Cincinnati	1	0	0
Cleveland	1	2	0
Toledo	1	0	0
Indiana:			
Indianapolis	2	0	0
Illinois:			
Chicago	1	1	0
Michigan:			
Detroit	1	0	0
Wisconsin:			
Milwaukee	2	0	1
Minnesota:			
Minneapolis	1	0	0
Missouri:			
St. Joseph	1	0	0
St. Louis	3	1	0
Nebraska:			
Omaha	1	0	0
Maryland:			
Baltimore	3	1	0
District of Columbia:			
Washington	5	4	1
Virginia:			
Lynchburg	1	0	0
Norfolk	1	0	0
West Virginia:			
Charleston	1	1	0
North Carolina:			
Winston-Salem	1	1	0
South Carolina:			
Greenville	2	0	0
Georgia:			
Atlanta	5	1	0
Kentucky:			
Louisville	1	0	0
Tennessee:			
Knoxville	0	1	0
Alabama:			
Birmingham	1	0	0
Mobile	1	0	0
Arkansas:			
Little Rock	0	1	0
Louisiana:			
Shreveport	0	2	0
Montana:			
Great Falls	1	1	0
California:			
Los Angeles	4	0	0
Sacramento	0	0	1
San Francisco	1	0	1

Dengue.—Deaths: San Antonio, Tex., 1.
Encephalitis, epidemic or lethargic.—Cases: New York, 3; Omaha, 1; Portland, Ore., 1; San Francisco,
Pellagra.—Cases: Charleston, S. C., 1; Atlanta, 2; Birmingham, 1.
Typhus fever.—Cases: New York, 1; Charleston, S. C., 1; Atlanta, 2; Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 26, 1936.—During the 2 weeks ended December 26, 1936, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			1	2	3	1	1			8
Chicken pox		1	1	433	637	83	201	13	208	1, 577
Diphtheria		5	2	30	8	5	1	5		56
Dysentery				1	1					2
Erysipelas				5	9	7	3	3	11	38
Influenza		3			21	9			7	40
Measles		2	20	545	489	26	759	289	1, 103	3, 233
Mumps			20		264	7	31	35	72	429
Paratyphoid fever					1					1
Pneumonia	1	2			18		4		9	34
Poliomyelitis					1	9			2	12
Scarlet fever		11	16	103	208	94	53	106	50	641
Smallpox								1		1
Trachoma									1	1
Tuberculosis	4	28	25	116	70	35	2	4	36	320
Typhoid fever			3	40	3	2	2	1		51
Undulant fever					3	1	1		1	6
Whooping cough		88		197	183	3	33	18	41	563

SWEDEN

Notifiable diseases—November 1936.—During the month of November 1936 cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	6	Poliomyelitis	[1] 189
Diphtheria	27	Scarlet fever	950
Dysentery	33	Typhoid fever	9
Epidemic encephalitis	4	Undulant fever	22
Paratyphoid fever	104	Weil's disease	3

[1] Includes 30 cases nonparalytic at time of notification.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936 3	Oct. 10	Oct. 17	Oct. 24	Oct. 31	November 1936 7	Nov. 14	Nov. 21	Nov. 28	December 1936 5	Dec. 12	Dec. 19	Dec. 26
Afghanistan	C						P											
Ceylon: Batticaloa	C						3											
India	C	15,291	17,917	25,973	19,883	4,172	4,352	3,569	3,761	4,563	4,664	5,068	6,347					
	D	7,672	8,500	12,681	9,785	1,965	1,998	1,680	1,755	2,212	2,339	2,663	3,194					
Assam	C	262	151	293	289	89	59	109	62	49	174	176	187	173	178	209		277
	D	152	75	180	158	38	38	59	29	20	88	82	79	69	87	85		143
Bassein	C	12	1	1														
Bombay Presidency	C	592	1,923	3,597	2,970	752	897	913	809	910	465	289	523	1,082		701		
	D	224	795	1,500	1,378	327	357	429	356	106	254	142	226	498		409		
Bombay	C	[1] 1	[1] 1		[2] 1		[1] 1								1	1		
Calcutta	C	580	154	103	54	13	11	10	9	30	14	13	19	15	19	18	15	9
Central Provinces and Berar	C	971	1,349	5,730	4,363	1,174	1,101	918	677	369	333	228	182	179	107	155	113	192
Chittagong	C	13	5	3	6			1	1			1		15	8			3
Madras Presidency	C	2,074	3,654	5,478	4,607	1,062	1,007	967	1,413	1,822	2,033	2,479						
	D	902	1,621	2,587	2,336	536	510	487	713	897	1,065	1,150						
Madras	C		6		8	1	8	3	9		6	6	17	28	41	19		
	D		1	1	1		1	2	3		1	1	5	5	14	7		
Moulmein	C	1																
Negapatam	C	13	15	24	9													17
	D	9	7	10	5													7
Northwest Frontier Province	C											2	5	77	4	1		2
Orissa Province	C													155	170	329	307	188
Punjab	C	231	418	652	169	10	1		7				7					
Rangoon	C	2	3	3			1		1	2	1	1	1	1	2			
Sind State	C			20	38													
Tuticorin	C		29									5	4	3	3			
India (French):																		
Chandernagor Territory	C	7	8															
Karikal Province	C	8	117	98	25	45		24				4			11			
Pondichery Province	C	4	1	1	4						2	2		6				
Indochina (see also table below): Cochinchina—Vinlong	C																1	

[1] Imported.

[2] Suspected.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936					November 1936				December 1936			
						3	10	17	24	31	7	14	21	28	5	12	19	26
Siam:																		
Bangkok	C	36	22	1														2
Provinces	C	34	66	117	57	8		6	3	1					12	44	59	90
On vessels:																		
S. S. *Ekma* at Rangoon from Calcutta	C	1																
S. S. *Chakdina* at Calcutta from Chittagong	C		1															

Place		July 1936			August 1936			September 1936			October 1936			Nov. 1–10, 1936
		1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	
Indochina (French) (*see also table above*):														
Cambodia [3]	C		2					2	2					
	D		2					2	1					
Cochinchina [3]	C	3	3	1				1			1			
	D	3	3	1				1			1			

[3] Reports incomplete.

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19	26
Algeria:																		
Algiers	C															[2] 1		
Plague-infected rats										2								
Oran Department	C			[2] 1	[2] 2													
Philippeville	C			[2] 1														
Argentina. (See table below.)																		
Belgian Congo	C								[2] 2									
Brazil (see also table below):																		
Santos	C			4														
	D			1														
Sao Paulo.[3]																		
British East Africa:																		
Kenya	C	39	13	25	14	5	3	4	3	1	4	3	6	5	4	1	3	
Uganda	C	76	96	97	87	15	21	17	11	17	18	21	23	23	15	19	14	
	D	73	93	91	78	15	21	17	11	15	15	13	22	23	15	18	13	
Ceylon:																		
Colombo	C	3	3	1	1				1	2		2	2		1			2
	D	3	3		1					1		2	1		1			2
Plague-infected rats		2	2	1	1	2		1	3	1		1			1			3
Maskiliya	C		1															
Southern Province	C			1														
China: Manchuria.[4]																		
Dutch East Indies: West Java	C	363	318	410	382	92	90											
	D	362	317	408	374	92	90											
Ecuador:																		
Alausi	C				1													
Babahoyo	C												5				2	
Plague-infected rats													6					
Bajada del Morro	C							[5] 3				4						
Guayaquil	C			4	2				2	3	1	6	9	5	5	2	6	
	D			1	3				1		2	5	2	5	2	2	9	
Plague-infected rats		3	5	4	6	1		1	1	1	2	1	4		3	1	4	
Playas	C															7	4	

[1] Including plague in the United States and its possessions.
[2] Suspected.
[3] A report dated July 29, 1936, states that 23 cases of pneumonic plague with 18 deaths were reported in Sao Paulo, Brazil.
[4] A report dated Aug. 20, 1936, states that 5 cases of plague were reported at Kirin Province, Manchuria, China.
[5] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19	26
Egypt:																		
Alexandria: Plague-infected rats		P	P	P	P	P		P		P		P						
Asyut Province	C	2			4					[6] 3	1							2
Beheira Province	C					1												
Girga Province	C									1		1						
Suez	C	1																
France: Marseille [7]	C			1	2													
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua district: [8]																		
Hamakua Mill sector							1			1								
Kukaiau [8]																		
Paauhau sector [8]			3	6	22	6	1		3	2	1			2	1	3	1	
Maui Island—Wailuku District—Keahua region									1									
India	C	139	294	900	1,172	486	469	326	438	573	478	438	615					
	D	92	186	531	430	141	151	115	114	163	143	139	171					
Bassein	C	2	9	5										1	1			
Plague-infected rats				1	1				1									
Bombay Presidency	C	4	3	10	72	17	12	36	11	33	11	15	26	5				
	D	2	2	6	45	17	6	15	11	17	5	10	16	4				
Bombay	C	1																
Calcutta	C		[3] 1															
Central Provinces and Berar	C		9	147	528	359	324	120	297	345	317	167	368	524	440	322	426	404
Madras Presidency	C		41	154	63	7	7	11	7	16	10	19				11	17	
	D		24	86	55	7	2	7	1	8	3	12				1	8	
Rangoon	C	2	2	3				1										
Plague-infected rats			1	4	3													
Indochina (see also table below):																		
Longxuyen	C	1																
Pnom-Penh	C			4														
Iraq: Baghdad Province	C									1								
Madagascar. (See table below.)																		
Malta	C	3		4	3	[3] 2			1		1	3	1	1				
	D	1		1														
Peru. (See table below.)																		
Senegal. (See table below.)																		

Tunisia: Tunis	C			2		2	2	1				1						1
Plague-infected rats		1	1	2														
Union of South Africa (see also table below)	C	32	⁹1	4	6				3		⁹3				⁹5			
United States:																		
California:																		
Eldorado County—Plague-infected chipmunk							1											
Lassen County—Plague-infected squirrels		5	1															
Modoc County [10]—Plague-infected squirrels		13	4	10														
Monterey County [10]	C	1																
Placer County [10]	C		1															
San Bernardino County.[10]																		
Santa Cruz County [10]—Plague-infected squirrels		50	11															
Ventura County—Plague-infected squirrels		P																
Idaho: Bonneville County—Plague-infected squirrels		7																
Montana: Beaverhead County.[11]																		
Utah:																		
Beaver County	C		1															
Plague-infected marmots				2														
Plague-infected squirrels			1															
Garfield County [12]—Plague-infected prairie dogs				2														
Sevier County.[12]																		
On vessels:																		
S. S. *Ipanema* at Marseille from Bone and Philippeville	C			1														
S. S. *Delambre* at Liverpool from Montevideo, Buenos Aires, Rosario, Santos, and Las Palmas—Plague-infected rats					2													

[5] Suspected.

[6] Includes 1 case of pneumonic plague.

[7] A report dated Sept. 3, 1936, states that 2 plague-infected rats were reported in Marseille, France.

[8] Plague-infected rats have been reported in Hawaii Territory, Hawaii Island, Hamakua District, as follows: Locality not specified, week ended Aug. 8, 2 plague-infected rats; Kukaiau, week ended Jan. 2, 1937, 1 plague-infected rat; Paauhau, week ended Jan. 2, 1937, 2 plague-infected rats.

[9] For 2 weeks.

[10] Plague-infected fleas have been reported in California as follows: Week ended June 27, 1936, 3 lots in Modoc County, and 7 lots in Santa Cruz County; Aug. 18–21, 104 plague-infected fleas collected from ground squirrels in San Bernardino County, and according to information dated Nov. 10, 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley, also in San Bernardino County have been proved positive for plague. A report dated Oct. 13, 1936, states that fleas taken from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague-infected.

[11] During the week ended July 25, 1936, 153 fleas and 26 lice taken from 7 marmots (ground hogs) shot at the head of Small Horn Canyon, Beaverhead County, Mont., were reported plague-infected.

[12] Plague-infected fleas in Utah have also been reported as follows: Aug. 24, 45 fleas taken from 23 prairie dogs in Garfield County, and July 28, 1936, 315 fleas taken from 11 ground squirrels in Clear Creek Canyon, Sevier County.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		June 1936	July 1936	August 1936	September 1936	October 1936	November 1936
Argentina:							
Buenos Aires—							
Plague-infected rats						4	
Catamarca Province	C					1	
Cordoba Province	C						4
Salta Province	C		4				
Santiago del Estero Province	C				[6] 2		
Tucuman Province	C		1		[13] 6		
Brazil (see also table above):							
Bahia State	C			[14] 46			
Ceara State	C			[14] 106			
Pernambuco State	C			[14] 45			
Piauhy State	C			[14] 4			
Indochina (see also table above):							
Cambodia	C		4	8			
Cochinchina	C	1	6	1			
Madagascar (central region)	C	38	26	83	104	160	
	D	36	26	81	95	154	

Place		June 1936	July 1936	August 1936	September 1936	October 1936	November 1936
Peru	C	2	4	6	8	16	33
Cajamarca Department	C						9
Lambayeque Department	C				3	1	3
Libertad Department	C	1	3	1	1	6	19
Lima Department	C		1	2	2	9	2
Callao	C	1					
	D	1					
Plague-infected rats				P	P		
Piura Department	C			3	2		
Senegal:							
Dakar [15]	C	2	1				
	D	2	1				
Thies [15]	C	1					
Tivaouane [15]	C	4	8	4			
Union of South Africa (see also table above)	C				21		

SMALLPOX

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936 3	10	17	24	31	November 1936 7	14	21	28	December 1936 5	12	19	26
Algeria:																		
Constantine Department	C	2	1															
Oran Department	C	6	2															
Philippeville	C			1														
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		

Bolivia. (See table below.)																		
Brazil:																		
Bahia	C		2	43	99	30	20	14	11	24	19	6	7					
Porto Alegre (alastrim)	D			2	1			1	2	1								
Recife (alastrim)	C									3	1		2					
British East Africa: Tanganyika	C	7	106	94	74	100	15	9		[1] 329			3	204	4			
British Somaliland	C	19		2														
Canada:																		
Alberta	C	[2] 2		[2] 1								[2] 1		[2] 3				
Saskatchewan	C		[2] 2	[2] 1														
Ceylon: Colombo	C			1			1											
China (see also table below):																		
Amoy	C	3	3															
Canton	C														1			
Dairen	C	9	2	2														
Foochow	C	P	P	P	P							P						
Hangchow	C	4	1		1													
Hankow	C	1													2			
Hong Kong	C	2	2		1													
Nanking	C	16	5							1	1				1			
Shanghai	C	17	14	9				4	1	2	3	1	4	16	14	10		23
Tientsin	C	3	1						1	1	1				2	1		
Chosen. (See table below.)																		
Colombia (see also table below)	C			126	[3] 76	[2] 50	22			[3] 12								
Barranquilla	D			6	1	1					3					5	2	
Ecuador: Guayaquil	C			1	1	3						[2] 3	5					
Egypt:																		
Alexandria	C											[4] 1						
Provinces	C	2																
Eritrea. (See table below.)																		
Ethiopia	C											13						
Finland	C		6	8														
France. (See table below.)																		
Gambia (Upper)	C		28															
Gold Coast	C		[6] 12															
Great Britain: England and Wales—London and Great Towns (Oldham)	C													1	2	5		
Greece: Salonika	C	34	13				10	10	10	10	10	8	8	8	8	10		
Guatemala. (See table below.)																		
India	C	16,397	10,011	5,419	3,413	687	533	279	317	572	818	848	880					
	D	4,696	2,955	1,478	886	166	135	81	73	127	200	208	220					
Assam	C	95	54	79	70	13	24	11	4	12	4	4	16	12	20	37		35
Bombay Presidency	C	962	647	510	258	52	62	23	22	19	10	26	38	42				
	D	102	128	100	46	11	14	9	6	1	3	9	6	9				
Bombay	C	99	46	39	17		6	3	1	1		1	1	1	1	2	2	2
	D	68	28	28	14		4	1		1		1	1	1			2	1
Calcutta	C	275	46	45	6	2	6		1	3	2		4	2	3	3	1	2
	D	168	38	39	8	2	4		1				1	1	2	1	3	1

[1] Delayed reports. [2] For 2 weeks. [3] For 3 weeks. [4] Imported. [6] Includes 1 case of pneumonic plague. [13] Pneumonic plague. [14] From Jan. to Aug. 31. [15] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19	26
India—Continued.																		
Central Provinces and Berar	C	1,100	477	187	70	13	6	3	17	7	9	2	9	18	19	38	11	47
Chittagong	D	3	11			[4]1			2					[4]2	2	6		2
Cochin	C				2													
Karachi	C	5	2								[4]1							3
Madras Presidency	C	796	752	1,122	442	106	93	102	80	89	92	56						
	D	137	160	205	96	19	23	22	21	11	14	7						
Madras	C			2	3				1				2	1	6	1		
Moulmein	C	21	18	10	12		2	1			2	1	4	5	13	1	8	9
Northwest Frontier Province	C	16	15	7	22	4	1	1	5	3	4	5	4	2	13			21
Orissa Province	C														49	121	75	131
Punjab	C	320	113	52	65	9	4		18	46	86	86	36	86	59		73	
Rangoon	C	7	1	5	1	2	2		5	1	2	4	4	1		1		[4]1
Sind State	C	194	54	31	51	1	7	7	6		2			50	35	60		42
Vizagapatam	C	2		2		1												
India (French):																		
Chandernagor Territory	C	8																
Pondichery Province	C		6	1														
	D		2															
India (Portuguese)	C					7												
Indochina (see also table below): Pnom-Penh	C	1	1	1	7		2	1	1		2	1	1	1		1		
Iran	C	7	1	6	9			2				1				1		
Teheran	C		1	3	4		2	1		1			1	1		1		
Iraq	C	1		1		3						3	3					
Baghdad	C			1														
Japan:																		
Osaka	C	1	2	11	21	2	1	1		12								
Tokyo	C													1				
Mexico (see also table below):																		
Chihuahua	C	2																
Durango	D														1			
Guadalajara	D	6	3	2	1													
Mexico, D. F.	C	15	7	7				1				2						
Torreon	C		3		3	8	1	1	1	2	1		1				2	1
Morocco. (See table below.)																		

Nigeria	C	1,028	[5] 512	34		[2] 75	25						12					
Lagos	C			1	1	1												
Northern Rhodesia	C										76	14						
Nyasaland. (See table below.)																		
Peru. (See table below.)																		
Portugal (see also table below):																		
Lisbon	C		2	2	1													
Oporto	C	1		1	1													
Sierra Leone	C	25	9	3	[2] 38		[3] 24		[3] 4		[2] 3		[2] 13					
Spain	C	23																
Straits Settlements: Singapore	C	[4] 1																
Sudan (Anglo-Egyptian)	C	5	1	13	105	30	6	17		43			56	57	71	11	26	8
Turkey. (See table below.)																		
Union of South Africa	C		1	P														
Uruguay. (See table below.)																		

On vessels:
S. S. *Jinkai Maru* at Moji from Hongay — 1 case — June 1, 1936
S. S. *Rohna* at Penang from Madras — 1 case — June 11, 1936

On vessels—Continued.
S. S. *Maya Maru* at Moji from Shanghai — 2 cases — June 18, 1936
S. S. *Talamba* at Rangoon from Calcutta — 1 case — Aug. 11, 1936

Place		June 1936	July 1936	August 1936	September 1936	October 1936	November 1936
Angola	C	7					
Argentina:							
Chaco Territory	C			1			
Corrientes Province	C	4		6	3	1	
Entre Rios Province	C					154	18
Jujuy Province	C	9	6	1			
Los Andes Territory	C					12	
Salta Province	C	120				31	
Santa Fe Province	C				2		
Belgian Congo	C	188	98	88	105		
Bolivia	C	8	29	12			
Chosen	C	84	21	10	3	2	
Colombia (see also table above):							
Barranquilla	D	1					
Eritrea	C				2		
France	C		36	2		1	10
Guatemala	C	3	5	13	1	1	1
Indochina (see also table above)	C	78	93	119	87	39	159
	D	10	8	21	8	12	33

Place		June 1936	July 1936	August 1936	September 1936	October 1936	November 1936
Mexico (see also table above):							
Aguascalientes State—Aguascalientes	C	1					
Chihuahua State—Chihuahua	C			1	1		
Colima State	C				1		
Jalisco State—Guadalajara	C	7		3	3		
	D	7		1	1		
Mexico State	C	2					
Mexico, D. F.	C	18	12	5	1		
Mexico City	D				1	1	
Nayarit State	D	1					
Puebla State—Puebla	C	3			2		
Queretaro State	C		1				
San Luis Potosi State—San Luis Potosi	C	1					
Morocco	C	3	3	2	1		
Nyasaland	C	4					
Peru	C	15	7	74	23		
Portugal (see also table above)	C	39		43	83	82	
	D	3		3	4	7	
Turkey	C		16				
Uruguay	C				1		

[2] For 2 weeks. [3] For 3 weeks. [4] Imported. [5] For 4 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Week ended— September 1936: 5	12	19	26	October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19
Algeria:																				
Algiers Department	C	85	73	24								2	1				4	1		[1] 3
Algiers	C	3	1	1							1				1		3			
Constantine Department	C	24	44	42			1		1	1			8	6	4	11	15	20		[1] 48
Bone	C																1			
Constantine	C	1	2	2				1						1	1		1			[1] 3
Philippeville	C	1																		1
Oran Department	C	8	1	2							1									
Australia: Sydney	C														1					
Basutoland	C		5		[2] 7															
Bolivia. (See table below.)																				
Bulgaria	C			1																
Ceylon: Colombo	C									1										
Chile	C	248		508	[1] 213			[3] 330			[3] 333									
Santiago	C			[3] 87	[1] 83						[3] 152									
Valparaiso	C	4	3	3	1				1	1		3	1				12	14	3	3
China:																				
Dairen	C									1	1			1						
Hankow	C	5	1																	
Nanking	C		1																	
Shanghai	C	7				2						2								
Tientsin	C	4	6	1						1										
Tsingtao	C		1	2																
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C		2	2						2										
Aswan Province	C						1													
Asyut Province	C		2	4									1							
Beheira Province	C	35	8	1																
Cairo	C	1	3	1					1	1	2			1						
Dakahliya Province	C	9	1																	
Faiyum Province	C		1																	1
Gharbiya Province	C	27	5	3									2							8
Girga Province	C		1	2															2	

Minufiya Province	C	2	1	2																
Port Said	C																			1
Sharkiya Province	C		7	4																
Suez	C	1		1																
Provinces	C	336	135	30		3	1	1	2	3	1	1	5	3	3	3	6		2	4
Finland. (See table below.)																				
France. (See table below.)																				
Greece (see also table below): Salonika	C	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C		3	3	4		2	1	4	2	4		2		2	5		1		1
Hungary	C				1															
Iran	C	17	8	4	2		6	3			3				1		1		3	
Teheran	C		1					2											1	
Iraq	C	1																		
Irish Free State:																				
Galway County:																				
Bothar Buidhe	C	1	1																	
Oughterard	C		2																	
Kerry County—Dingle	C			2	1	2				2										
Lithuania	C	11																		
Mexico (see also table below):																				
Durango	D			1																
Mexico, D. F.	C	13	14	20	6	7	6	4		4	2	6	4		4					
Saltillo	D										1									
San Luis Potosi	D	1	1													1			1	
Torreon	C	1	1			1						2								
Morocco (see also table below)	C	7	6	1																1
Palestine:																				
Haifa	C	13	6	13	1	4	5	6		3	2	2	3	2	3		2	3	2	3
Jaffa	C		5	13	5	3	7	8	4	3	3	2		6	1				4	4
Panama Canal Zone. (See table below.)																				
Paraguay: Asuncion	D			3	1															
Peru. (See table below.)																				
Poland	C	252	136	49	6	11	4	26	16	9	13	6	19	15	34	46	36	53	40	
	D	15	11					3						1	1	1	3	5	2	
Portugal. (See table below.)																				
Rumania. (See table below.)																				
Sierra Leone: Freetown	C													1						
Spain: Catalonia	C		1																	
Straits Settlements: Singapore	C		3			2		1												
Sudan (Anglo-Egyptian)	C																			8
Tunisia:																				
Tunis	C	3	2	1	2						1		1			3				
Provinces	C	49	40	21	10	3		6	7	12	3	5		6	2	23	12		48	6
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				

[1] For 2 weeks. [2] For 6 weeks. [3] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		June 1936	July 1936	August 1936	September 1936	October 1936	November 1936
Bolivia	C	46	47	29			
China: Manchuria—Harbin	C	29	15	3	4		
Chosen	C		80	20	24	24	
Czechoslovakia	C	23	4	1	1		
Finland	C			1	1		
France	C						1
Greece (see also table above)	C	4	3	10	9	11	
Guatemala	C	59	30	30	38	17	33
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C	1		3	1		
Chihuahua State	C				1		
Durango State	D			1			
Guanajuato State	C			7			
Jalisco State: Guadalajara	C	1	1	1	1		
Mexico State	C		3	10	4		
	D	1	2	2			
Mexico, D. F.	C	23	23	19	21		
Mexico City	C						
	D				8	7	
Mexico—Continued.							
Oaxaca State	C	1		4	2		
Puebla State: Puebla	C	3		10	6		
Queretaro State	C	1		1	1		
San Luis Potosi State: San Luis Potosi	C	3	3	4	1		
Sinaloa State	D		1				
Morocco (see also table above)	C	9	6	2			1
Panama Canal Zone	C	2					
Peru	C	47	268	67	48		
Portugal	C	1		1	2		
Rumania	C	427	168	32	25	60	
Turkey	C	25	39	15	27	21	18
Istanbul	C	1	2	1	1	3	1
Union of South Africa:							
Cape Province	C	60	58	113	43	75	
Natal	C	1				7	
Orange Free State	C	24	2	15	14	43	
Transvaal	C	1			1	4	
Yugoslavia	C	78	53	16	6		7

YELLOW FEVER

Place		May 31–June 27, 1936	June 28–July 25, 1936	July 26–Aug. 29, 1936	Week ended— September 1936				October 1936					November 1936				December 1936			
					5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26
Belgian Congo.[1]																					
Bolivia: Santa Cruz Department.[3]																					
Brazil:																					
Matto Grosso State	C	1																			
Minas Geraes State	C	1																			
	D	1																			
São Paulo State	C	6																			

Cundinamarca Department	D		2	1																	
Intendencia of Meta—																					
Acacias	D														1						
Quenane	C											1									
Restrepo [4]	D		2	2		1						1									
Villavicencio [4]	D						1					2									
Santander Department [4]	D		2	4				1													
Dahomey	C		[2] 1				[2] 1	1							1						
French Guinea—Macenta	C					1	[2] 1			1											
Gold Coast: Tamale	C																			1	
Nigeria:																					
Aba	C						[2] 1														
Calabar	C														1						
Ilorin Province	D							[2] 1													
Kano	C			[2] 1																	
Maiduguri	D													1							
Uyo	C																				1
Senegal:																					
Bambey	C															1					
Khombole	C												1	1							
M'Bour	C																[2] 1				
Thies	C	1											[2] 1				[2] 1				
Tivaouane	C	2				1															
Sierra Leone [5]	C							[2] 1			1										
Sudan (French):																					
Katibougou	C									1											
Kayes	C		[2] 1																		
Koulikoro	C						1			2											
Segou	C												1								

[1] Information dated Jan. 23, 1937, states that the suspected fatal case of yellow fever reported Dec. 22, 1936, at Mangembo, Belgian Congo (p. 123 of PUBLIC HEALTH REPORTS of Jan. 22, 1937), has not been confirmed.

[2] Suspected.

[3] Yellow fever has been reported in Santa Cruz Department, Bolivia, as follows: For the months of April, 1 case; May, 1 case; June, 2 cases.

[4] Yellow fever has also been reported in Colombia as follows: Restrepo, June 4 to July 30, 7 deaths; Villavicencio, January, June, and July, 6 deaths; Santander Department, June and July, 6 deaths.

[5] Information dated Jan. 7, 1937, states that the suspected case of yellow fever reported Nov. 16, 1936, at Freetown, Sierra Leone (pp. 1731 and 1815 of PUBLIC HEALTH REPORTS), has not been confirmed by the protection test.

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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MORTALITY FROM CERTAIN CAUSES DURING THE FIRST 9 MONTHS OF 1936[1]

This report presents mortality data for 29 States, the District of Columbia, and Hawaii for the first 9 months of 1936, with comparative data for recent years. In addition to the death rate from all causes, rates are shown for 17 specific causes, 4 groups of causes, and for infant and maternal mortality.

The rates are computed from current and generally preliminary reports furnished by State departments of health. Because of some lack of uniformity in the method of classifying deaths according to cause, some delayed death certificates, and various other reasons, these preliminary rates cannot be expected to agree in all instances with final rates published by the Bureau of the Census. The final figures are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying table are intended to serve as a current index of mortality until final figures are available.

The populations used for 1934 and 1935 are the official estimates as published by the United States Bureau of the Census on May 11, 1936, which are corrected to agree with the population of the United States as computed from births, deaths, immigration, and emigration since the 1930 census. The populations used for 1936 are the same as those used in previous mortality summaries for that year,[2] and were arrived at by extrapolation from the official 1935 estimates, using the same annual increment as that used by the Bureau of the Census for the year 1935 as compared with 1934. Populations for 1933 were estimated by making the increment for 1934 over 1933 the same as that used by the Census Bureau for 1935 as compared with 1934.

At the top of the table, rates are given for a group of 21[3] States with an estimated population of 72,000,000 that have data available for the first 9 months of each of the 4 years 1933–36. For individual States, data are shown for the first 9 months or for as many of those months as can be included on the basis of available information, with

[1] From the Office of Statistical Investigations, U. S. Public Health Service.
[2] Public Health Reports, July 3 and Oct. 30, 1936.
[3] See footnote to table for States included.

rates for corresponding periods of 2 preceding years. The following comparisons refer only to the 21 States with complete data.

The death rate from all causes for the first 9 months of 1936 was 11.4 per 1,000 (annual basis), as compared with 10.8, 11.0, and 10.6 in the first 9 months of 1935, 1934, and 1933, respectively. In 17 of the 21 States the rate was higher in the first 9 months of 1936 than in the same period of 1935. In all three quarters of 1936 the rates exceeded those for the corresponding quarters in the 3 preceding years.

The relatively high mortality from all causes is partly accounted for by the increased mortality from influenza and pneumonia during the first half of 1936. The combined mortality from these causes was slightly higher in the first half of 1936 than in the same period of 1935 and 1933, and markedly higher than in 1934, a year of low influenza and pneumonia mortality. Rates for pneumonia were higher in all three quarters of 1936 than in corresponding quarters of the 3 years immediately preceding; 17 of the 21 States showed an increase over the first 9 months of last year and 4 a decrease. Mortality from influenza in the first 9 months of 1936 was about the same as in 1935, higher than in 1934, but lower than in 1933 for the same period; only 6 of the 21 States reported higher rates in the first 9 months of 1936 than in the same period of 1935.

Infant mortality in the first 9 months of 1936 was slightly below last year. Among 21 States with complete data, 12 had lower rates and 9 had higher rates than in 1935.

The mortality rate from meningitis was higher during the first 9 months of 1936 than during the corresponding period in any of the 3 preceding years; 14 of the 21 States had higher rates than in 1935. The incidence of meningitis has stood at a relatively high level since the latter part of 1934. The other infectious disease rates were less in 1936 than in preceding years.

Heart diseases, cerebral hemorrhage, cancer, and diabetes showed increases over recent years. The rise was particularly large for heart diseases, and 20 of the 21 States showed increases over 1935. Although the increase was less for apoplexy and diabetes, it was general, 20 and 19 States, respectively, showing increases for these diseases over 1935. Although the average rate for cancer increased, there were decreases in 9 of the 21 States.

The average tuberculosis rate declined only slightly from the 1935 level, but 9 of the 21 States showed increases

Mortality from certain causes in the first 9 months of 1936, with comparative data for the corresponding period in preceding years

State and period	All causes, rate per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: All except malformations and early infancy	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Encephalitis, epidemic or lethargic (17)	Meningococcus meningitis (18)
21 STATES [a]													
January to September—													
1936	11.4	52	22	5.2	1.5	0.7	2.3	1.9	1.5	21.3	0.4	0.6	2.5
1935	10.8	53	23	5.4	1.8	3.9	2.4	3.8	1.8	20.9	.7	.7	2.2
1934	11.0	58	25	5.7	2.3	4.9	2.2	4.8	1.8	14.8	.6	.7	.9
1933	10.6	55	24	5.8	2.3	1.9	2.1	2.9	1.8	27.0	.7	.8	1.2
January to March—													
1936	12.6	58	27	5.8	.9	.9	3.4	2.0	2.2	36.6	.2	.6	3.4
1935	12.0	64	31	6.1	.9	5.0	3.3	3.9	2.4	43.9	.3	.6	2.4
1934	11.9	64	30	6.0	.9	5.7	3.3	4.0	2.5	27.7	.3	.6	1.0
1933	11.9	66	32	6.3	1.2	1.9	3.2	2.7	2.5	64.6	.3	.8	1.6
April to June—													
1936	11.3	52	21	5.3	1.0	1.1	2.7	1.9	1.2	23.0	.1	.6	2.9
1935	11.1	54	22	5.5	1.2	6.2	3.1	5.1	1.4	14.6	.3	.8	2.9
1934	11.1	59	25	6.1	1.7	7.6	2.4	5.2	1.4	12.5	.4	.6	1.0
1933	10.5	54	22	5.8	1.7	3.3	2.5	2.7	1.3	12.5	.5	.7	1.3
July to September—													
1936	10.3	46	18	4.7	2.7	.3	.7	1.8	1.2	4.5	.7	.6	1.1
1935	9.6	44	16	4.6	3.4	.7	1.0	2.6	1.6	4.6	1.5	.6	1.5
1934	9.9	52	21	5.0	4.3	1.5	.8	5.0	1.5	4.4	1.0	.9	.7
1933	9.5	46	19	5.2	4.3	.4	.8	3.2	1.7	4.7	1.4	1.1	.6

State and period	Tuberculosis, all forms (23-32)	Cancer, all forms (45-53)	Diabetes (59)	Diseases of the nervous system (78-89)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the circulatory system (90-103)	Diseases of the heart (90-95)	Diseases of the respiratory system (104-114)	Pneumonia, all forms (107-109)	Diseases of the digestive system (115-129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130-132)
21 STATES [a]												
January to September—												
1936	52.4	114.9	26.1	108.9	85.9	299.8	275.5	100.8	88.9	67.7	8.2	82.3
1935	52.6	112.6	24.0	103.1	82.4	274.8	250.6	94.5	82.2	66.9	7.6	80.6
1934	53.7	110.6	24.2	99.8	78.0	277.5	247.8	92.2	80.0	71.6	10.5	85.3
1933	56.9	107.5	23.2	100.7	77.5	258.6	225.7	81.3	69.3	69.9	9.8	83.0
January to March—												
1936	53.7	114.5	30.3	120.6	91.4	338.9	311.7	158.4	142.8	61.7	4.9	92.3
1935	54.7	110.2	27.0	111.8	90.0	306.5	279.8	141.3	127.2	63.0	4.2	87.9
1934	55.1	108.1	27.3	110.4	85.5	316.0	290.7	137.8	122.1	63.7	5.8	93.3
1933	59.2	106.7	27.0	112.2	86.9	291.6	255.4	126.9	112.5	61.6	5.6	90.4
April to June—												
1936	53.7	115.5	25.7	108.0	87.5	300.9	275.9	98.8	87.5	64.0	5.7	83.6
1935	55.9	115.4	24.0	106.1	83.6	280.1	256.0	97.5	83.9	67.1	7.7	83.1
1934	56.7	112.6	24.5	101.0	78.8	281.3	250.8	95.2	81.5	69.8	8.3	86.8
1933	59.5	107.7	22.9	102.7	78.5	260.4	226.8	75.0	62.3	69.4	8.9	84.4
July to September—												
1936	49.7	114.8	22.3	98.4	79.1	260.1	239.3	45.7	37.1	77.3	13.9	71.1
1935	48.1	112.2	21.3	91.5	73.9	238.6	216.9	45.6	36.6	70.5	10.9	71.0
1934	49.4	111.0	20.7	88.2	70.0	236.1	212.8	44.7	36.4	81.2	17.4	76.0
1933	52.0	108.0	19.8	87.6	67.2	224.5	195.6	43.0	33.8	78.5	14.8	74.4

[a] States included are Connecticut, District of Columbia, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, New Jersey, New York, Pennsylvania, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin (estimated population July 1, 1934, 71,740,000). Includes all of the States with available data for the 4 years covered by this summary. For a few causes, 1 to 3 States were omitted because of missing data.

Mortality from certain causes in the first 9 months of 1936, with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: All except malformations and early infancy	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Encephalitis, epidemic or lethargic (17)	Meningococcus meningitis (18	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130–132)
JANUARY TO SEPTEMBER																									
Alabama:																									
1936	10.9	66	40	6.5	2.7	0.8	0.4	2.9	2.8	56.9	1.3	0.3	.8	65.5	57.8	12.5	91.4	65.8	161.6	146.6	112.6	104.0	64.7	17.9	78.7
California:[1]																									
1936	13.6	53	24	5.0	1.0	4.2	2.2	2.1	2.1	17.2	.5	.5	2.9	85.3	152.9	26.4	120.2	95.0	404.7	366.0	96.1	81.8	86.7	8.7	92.0
1935	13.0	50	20	4.8	1.2	1.8	1.2	1.2	1.8	11.6	.7	.4	2.2	84.2	147.2	27.0	119.0	90.9	395.7	349.4	83.4	70.4	82.0	6.6	90.6
1934	12.2	53	23	4.6	1.3	2.2	1.6	4.1	1.9	7.1	1.9	.5	.9	86.2	139.8	24.2	112.4	84.3	350.2	313.3	77.7	65.5	75.0	9.0	85.8
Connecticut:																									
1936	10.1	42	(2)	4.9	.2	.5	.7	1.7	.2	9.4	.2	.2	.9	38.3	124.7	27.2	(2)	(2)	(2)	230.4	(2)	73.6	(2)	3.0	86.9
1935	10.2	44	(2)	4.6	.9	2.5	1.5	.9	1.0	8.8	1.2	.4	.9	42.9	125.5	31.4	(2)	(2)	(2)	220.2	(2)	69.1	(2)	1.9	86.6
1934	10.0	52	(2)	6.3	.5	.5	.6	1.0	.2	7.2	.1	.2	.5	42.7	122.2	26.0	(2)	(2)	(2)	215.0	(2)	64.8	(2)	5.1	84.4
District of Columbia:																									
1936	14.5	67	30	6.2	1.3	1.5	.4	6.4	4.7	8.5	.4	.9	11.1	106.8	132.1	28.5	135.3	100.8	381.6	332.2	155.3	133.3	79.8	8.5	96.8
1935	14.4	61	26	6.1	1.8	(2)	1.8	.2	3.4	12.6	1.8	1.1	16.9	106.9	126.3	26.6	123.1	97.0	375.7	330.2	140.5	130.1	95.9	11.0	100.8
1934	14.7	66	34	3.1	1.7	11.5	1.2	7.9	1.2	7.4	.2	.7	.5	113.4	134.7	32.9	126.3	94.3	395.4	343.3	137.8	118.7	66.1	12.4	112.0
Florida:																									
1936	12.5	59	30	7.6	2.8	.3	.1	1.6	2.3	56.7	.6	.5	3.1	53.6	84.0	18.4	127.6	100.1	254.6	235.2	93.8	84.8	84.0	8.5	105.2
1935	12.0	64	34	7.9	4.1	2.3	.1	3.3	3.8	41.1	.5	.1	.5	54.1	85.7	18.9	118.0	92.6	226.2	207.2	77.0	62.9	90.5	14.1	104.7
1934	12.5	69	35	8.1	3.2	8.0	.3	6.2	4.0	23.2	.6	.4	.3	60.7	82.1	16.6	123.4	94.0	237.8	218.7	88.7	76.3	89.4	13.4	120.2
Georgia:																									
1936	10.4	68	(2)	7.9	5.8	.2	.4	2.0	2.6	61.5	.5	.3	2.1	50.7	49.0	10.6	97.2	71.0	168.2	157.0	115.6	107.1	66.4	15.6	94.3
1935	9.7	69	(2)	7.4	7.3	.9	.6	5.3	2.9	42.4	.4	.2	.8	52.0	48.0	10.8	94.0	65.8	151.7	141.8	90.9	82.5	68.2	15.9	91.3
1934	10.4	82	(2)	7.6	10.2	21.1	.5	11.1	3.8	28.1	.7	.2	.5	53.6	49.8	11.2	99.6	64.8	158.2	145.9	98.7	89.7	75.7	21.6	95.1
Hawaii:																									
1936	7.9	71	39	3.8	2.1	(2)	(2)	.6	2.1	13.1	.3	.6	1.8	77.3	63.6	16.2	54.7	44.0	127.8	119.5	80.4	68.8	63.0	16.8	65.4
1935	7.7	67	38	4.6	1.9	(2)	(2)	3.1	.3	5.7	(2)	(2)	.9	74.2	62.3	15.7	59.1	44.7	109.2	101.3	73.6	62.0	62.9	19.8	68.3
1934	8.6	79	52	5.3	3.9	.3	(2)	15.5	.6	15.1	.3	(2)	1.9	81.2	57.3	15.8	59.6	38.3	106.0	96.3	141.8	126.6	77.6	30.0	56.7
Idaho:																									
1936	10.5	45	16	3.4	2.2	1.9	12.4	1.9	.8	16.0	.6	1.1	6.9	26.2	76.8	13.5	106.0	73.5	232.5	181.2	115.1	98.9	66.1	5.8	25.1
1935	9.9	53	21	7.1	2.0	2.5	4.7	8.9	.3	17.3	.8	2.2	4.5	23.2	64.2	12.8	92.9	65.6	206.6	156.3	107.5	92.1	60.0	2.2	33.2
1934	9.9	53	19	5.9	4.8	4.2	2.8	3.7	2.5	14.7	4.2	2.0	2.5	30.8	71.8	11.0	96.4	70.1	187.7	154.9	106.8	95.0	74.3	11.9	35.1

Illinois:																									
1936	11.9	48	19	4.4	.8	.2	3.5	2.0	2.4	14.0	.6	.5	2.5	52.5	131.6	29.0	102.5	79.0	339.2	314.3	90.7	78.6	72.6	6.3	103.0
1935	10.9	47	17	5.1	1.3	4.9	6.0	3.0	2.5	18.0	.4	.5	2.9	52.9	127.1	24.7	93.5	70.8	294.4	273.8	87.3	77.4	69.5	4.7	96.9
1934	11.3	53	21	5.0	1.5	3.3	3.8	4.2	1.5	10.1	.4	1.1	1.8	53.6	124.1	28.9	99.7	71.7	295.0	272.2	82.4	72.6	78.2	8.5	107.5
Indiana:																									
1936	12.0	52	22	5.1	1.5	.2	3.4	1.7	2.7	30.7	.3	.7	2.1	48.8	107.9	17.2	(2)	130.6	(2)	269.9	(2)	100.3	(2)	8.4	77.4
1935	11.2	54	24	5.2	1.4	3.5	3.3	4.9	2.5	27.8	.2	.8	2.8	48.7	112.3	14.4	(2)	125.0	(2)	261.8	(2)	85.9	(2)	6.6	66.7
1934	11.8	54	25	5.4	3.1	8.1	3.3	5.7	2.4	20.4	.7	1.0	.7	52.5	110.1	17.8	(2)	123.6	(2)	262.7	(2)	77.2	(2)	11.9	77.0
Iowa:																									
1936	10.1	(2)	(2)	(2)	1.2	.1	3.3	1.5	.8	19.1	.2	.4	2.0	22.4	122.7	24.6	142.3	108.0	266.7	234.9	78.1	69.5	59.6	3.8	60.6
1935	10.4	50	21	5.5	1.4	8.0	2.4	1.9	1.9	24.1	.4	.7	1.9	26.3	126.4	20.8	129.2	104.3	251.3	226.1	87.8	79.1	62.0	4.3	61.9
1934	10.6	55	21	5.7	2.0	3.0	2.3	4.3	1.4	20.2	.3	1.0	1.2	25.2	122.2	23.1	144.1	110.9	233.6	203.1	88.5	76.1	66.8	7.0	66.1
Kansas:																									
1936	12.0	53	23	6.0	1.7	.1	4.9	1.0	2.2	54.0	.7	1.2	1.3	31.2	117.6	22.9	133.6	107.8	281.6	249.5	97.8	88.2	75.5	6.5	102.4
1935	11.1	50	23	5.1	1.7	16.3	2.2	3.3	1.7	35.7	.3	1.7	2.3	29.2	113.0	22.2	122.5	98.6	249.5	221.5	97.2	86.3	73.8	6.3	93.8
1934	11.0	51	20	5.8	1.5	2.3	2.2	5.9	2.2	19.8	.8	1.3	1.2	28.8	115.8	24.4	123.6	98.1	240.7	210.9	66.8	57.7	82.3	7.3	102.0
Louisiana:																									
1936	12.0	76	40	10.1	7.4	2.8	.3	5.0	3.6	55.1	.4	.1	2.1	73.6	76.7	17.6	93.2	70.5	226.4	196.4	131.2	117.5	80.6	17.1	106.7
1935	10.8	69	37	8.0	9.9	7.6	.6	2.9	4.5	24.3	.8	.4	.8	73.2	78.0	15.6	88.9	65.9	195.4	172.8	93.1	81.7	82.3	18.0	106.3
1934	10.6	72	41	9.3	10.0	9.6	.8	12.8	4.0	19.9	.4	.3	.6	71.4	72.9	13.2	81.8	56.3	205.1	184.9	82.7	70.9	75.1	20.0	109.8
Maryland:																									
1936	13.0	62	29	4.8	1.8	1.8	.7	4.3	1.3	11.7	(3)	1.0	8.6	82.4	127.8	27.4	134.1	112.0	326.9	301.4	121.9	110.3	66.0	10.9	141.6
1935	12.7	61	29	4.9	2.3	1.5	2.1	3.3	1.1	17.5	.2	1.0	5.2	82.3	129.1	26.3	135.0	111.1	293.4	269.2	116.6	105.3	73.3	14.6	136.0
1934	12.6	68	32	5.6	2.5	11.5	1.5	8.9	1.0	8.4	.4	.8	.2	80.9	128.3	23.7	128.6	102.3	292.4	267.6	114.4	102.1	68.3	15.4	142.7
Michigan:																									
1936	11.8	51	21	5.0	.7	.2	2.5	2.3	.8	13.0	.4	.5	1.3	45.6	119.1	26.8	124.0	97.4	315.6	287.2	103.4	90.0	78.0	9.5	65.8
1935	11.0	49	18	5.1	.7	5.2	2.2	3.0	.9	17.2	.7	.3	1.0	46.0	111.3	25.7	115.9	88.2	290.9	265.4	97.8	84.6	69.6	4.8	63.8
1934	10.9	53	19	5.6	1.3	.9	4.4	3.7	.8	12.7	.6	.3	.5	48.1	110.0	23.8	121.7	93.1	279.7	253.3	89.7	76.8	76.0	8.0	66.2
Minnesota:																									
1936	10.9	44	17	4.3	.6	1.1	5.1	1.0	.4	13.9	.2	.8	1.9	36.6	129.9	26.7	113.9	86.6	266.1	242.5	91.8	81.8	64.3	5.0	48.2
1935	10.0	48	18	4.8	.7	3.2	3.4	2.9	.5	17.7	.4	.8	1.8	35.8	131.0	22.2	104.8	83.3	233.9	209.1	87.6	77.0	64.1	4.0	47.6
1934	10.1	48	16	5.2	.7	1.8	1.1	4.4	.8	14.9	.8	1.2	.8	35.9	131.6	22.6	101.1	79.6	234.1	210.9	89.3	77.0	69.8	4.2	51.9
Mississippi: [1]																									
1936	11.6	(2)	(2)	(2)	4.0	1.9	.2	2.7	1.5	94.2	.4	.3	1.4	58.3	56.5	11.4	89.5	71.5	148.3	132.8	96.6	89.9	69.0	18.6	97.5
1935	11.3	(2)	(2)	(2)	3.0	1.5	.5	6.4	3.5	59.6	.4	.3	1.4	59.8	63.1	11.8	87.6	71.1	139.0	121.0	75.8	69.2	68.3	14.9	104.9
1934	11.9	(2)	(2)	(2)	3.9	24.0	.4	20.2	2.6	30.8	1.2	.8	.7	67.7	58.5	9.4	88.0	77.6	133.1	115.5	80.7	78.0	79.7	26.2	94.8
Montana:																									
1936	11.6	50	(2)	5.0	1.5	.8	9.1	4.0	2.5	21.9	.2	.5	4.0	43.3	104.6	22.1	119.0	91.6	205.8	191.2	131.8	115.5	90.1	11.0	73.7
1935	11.7	56	(2)	4.3	1.8	11.8	2.5	5.3	3.0	44.6	.3	1.0	2.3	48.3	99.7	19.1	116.3	88.9	216.8	201.2	132.2	119.1	98.7	6.3	78.1
1934	10.4	49	(2)	6.0	2.8	3.3	2.3	4.3	1.5	28.7	3.3	1.0	1.0	48.8	91.4	21.2	102.2	77.3	190.6	172.5	91.7	76.5	85.6	14.4	71.0
Nebraska:																									
1936	10.2	44	15	5.9	.9	1.0	6.0	1.7	1.6	21.3	.8	.5	1.4	18.4	112.5	26.8	120.7	93.9	242.5	225.3	81.3	69.8	78.4	4.6	72.4
1935	9.8	43	17	5.6	.5	8.2	2.5	1.2	1.3	26.1	.3	.4	3.5	22.8	105.8	18.9	128.8	101.5	206.9	188.4	100.1	86.3	66.4	3.8	50.4
1934	10.0	48	16	5.9	1.3	2.1	1.4	7.1	1.7	18.3	.6	.4	1.2	23.1	113.6	20.3	125.1	99.1	211.9	190.6	86.1	75.8	76.9	6.0	63.3
New Jersey:																									
1936	10.2	44	(2)	3.9	.6	.4	.8	1.4	.3	7.8	.2	.8	2.0	51.0	123.0	30.6	96.3	80.3	315.2	294.7	78.8	68.9	58.4	3.6	76.5
1935	10.0	46	(2)	4.5	.6	1.7	.7	2.5	.9	10.6	.7	.6	.8	50.3	120.8	28.4	95.1	76.4	300.7	280.7	71.9	62.5	56.1	3.5	79.7
1934	10.1	49	(2)	5.2	.9	1.5	1.9	1.4	1.2	6.0	.3	.8	.4	53.7	119.5	26.9	98.2	80.2	301.2	281.3	76.1	65.9	58.0	5.4	82.1

[1] January to July only.
[2] Data not available.
[3] No deaths.

Mortality from certain causes in the first 9 months of 1936, with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Rate per 1,000 live births			Death rate per 100,000 population (annual basis)																						
		Total infant mortality	All except malformations and early infancy	Maternal mortality	Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Encephalitis, epidemic or lethargic (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130–132)
JANUARY TO SEPTEMBER—continued																											
New York:																											
1936	11.9	46	17	5.1	0.6	1.3	1.7	1.0	0.5	6.8	0.1	0.6	2.4	59.7	144.8	35.5	102.0	79.1	374.0	348.0	101.4	91.2	69.8	6.0	78.2
1935	11.6	49	19	5.2	.5	1.9	1.7	2.8	.8	7.7	1.2	.6	2.4	58.5	142.4	32.6	97.2	76.1	350.0	317.8	97.3	86.9	68.2	6.6	80.5
1934	11.7	53	21	5.5	.6	.7	1.5	1.6	1.1	6.6	.5	.5	.7	60.4	136.7	32.0	72.4	50.3	373.7	321.0	100.5	89.8	71.4	7.1	85.3
North Carolina:																											
1936	10.3	66	(2)	6.5	2.0	.2	.5	1.1	2.9	36.9	.5	.5	1.6	61.9	50.4	11.9	(2)	(2)	(2)	(2)	(2)	106.3	(2)	22.4	(2)
1935	9.8	68	(2)	6.7	2.3	2.7	.5	10.7	2.7	33.4	2.2	.3	.9	57.8	48.9	9.8	(2)	(2)	(2)	(2)	(2)	89.8	(2)	22.5	(2)
1934	10.5	78	(2)	7.1	2.9	12.0	1.1	14.2	4.4	21.7	.4	.4	.5	64.5	50.0	10.7	(2)	(2)	(2)	(2)	(2)	100.6	(2)	29.7	(2)
Pennsylvania:																											
1936	11.0	48	20	4.6	.8	.4	1.7	1.2	1.2	15.2	.2	.6	1.4	44.7	111.0	28.1	106.8	86.2	312.5	290.3	92.9	80.1	54.5	5.9	82.2
1935	10.6	51	24	5.1	.8	2.9	2.1	2.1	1.5	20.2	.3	.8	1.3	45.9	105.9	26.9	103.5	79.8	291.5	268.6	95.1	81.8	56.3	5.6	83.3
1934	10.8	59	29	5.8	1.1	3.3	2.5	3.3	2.1	15.1	.3	.6	.7	48.2	106.0	27.1	103.0	80.8	288.1	261.1	95.0	81.8	61.9	8.3	90.2
Rhode Island: [4]																											
1936	12.0	54	17	4.9	.2	.4	2.0	1.3	.2	12.1	(3)	.4	4.0	50.7	136.1	33.7	115.4	96.3	375.6	351.5	105.5	89.8	62.6	4.4	101.3
1935	11.1	49	17	4.0	.4	1.5	.4	1.3	.7	11.0	2.2	.2	3.1	52.5	146.9	34.8	113.6	94.2	364.2	340.6	93.3	84.5	66.8	5.3	104.3
1934	11.7	56	19	5.7	.7	.4	.7	4.0	.2	8.8	.2	.2	.7	46.5	135.9	34.2	118.2	95.1	345.4	320.7	94.4	83.2	64.2	4.2	115.8
South Carolina:																											
1936	9.7	82	(2)	8.2	7.7	.4	.3	3.2	2.3	48.9	.8	.1	2.7	47.1	42.1	9.2	96.8	85.0	175.3	160.6	107.5	98.9	36.6	11.7	80.9
1935	9.7	81	(2)	9.8	9.3	1.3	.2	9.7	2.0	45.1	.7	.7	1.2	48.3	41.8	9.7	96.7	85.1	171.8	160.9	80.3	75.1	32.2	7.7	83.8
1934	10.2	93	(2)	10.0	8.8	11.6	.4	16.0	2.5	34.3	.5	2.0	.7	52.7	45.3	10.1	(2)	(2)	177.1	(2)	(2)	84.7	43.4	(2)	94.8
South Dakota:																											
1936	9.4	47	19	4.3	2.2	.4	4.2	.6	1.0	22.4	(3)	.2	(3)	25.6	93.6	22.8	110.4	85.7	176.1	160.1	81.7	69.1	64.3	10.5	65.5
1935	9.5	51	25	6.3	1.6	5.5	1.8	4.8	1.2	37.4	1.2	.8	.4	41.8	89.5	20.6	107.6	80.8	160.2	142.0	120.0	104.4	61.8	7.1	60.0
1934	9.8	63	30	4.6	1.4	22.3	1.6	9.9	1.2	29.4	1.4	.4	(3)	35.7	89.3	23.3	105.9	78.9	168.0	148.3	94.6	85.2	72.6	10.1	60.1
Tennessee:																											
1936	10.9	69	42	7.2	4.3	1.0	.7	2.3	2.9	59.9	1.4	1.0	4.1	87.6	60.6	11.3	97.7	76.6	170.0	156.0	127.6	116.4	78.3	19.3	66.2
1935	9.8	66	40	6.9	5.7	1.6	.6	15.9	3.8	41.3	.7	.5	3.9	81.4	62.3	10.9	92.5	72.6	148.8	134.8	102.6	86.8	76.1	19.5	59.6
1934	10.2	78	49	6.8	6.3	20.0	1.4	9.0	3.2	32.5	1.3	1.0	1.3	84.1	60.2	9.6	92.7	74.0	149.6	137.7	99.7	83.4	85.8	25.7	60.9

Virginia:																									
1936	11.3	63	(²)	5.1	2.3	1.2	.4	4.3	2.4	40.7	.4	.4	5.7	67.5	70.2	15.7	121.3	95.5	242.4	233.6	103.0	92.6	55.6	9.9	93.4
1935	10.9	66	(²)	5.2	2.4	6.6	1.0	9.0	3.0	40.7	1.9	.6	3.9	71.2	71.3	15.1	115.1	93.1	228.1	210.5	88.6	79.3	57.4	12.3	86.9
1934	10.9	70	(²)	6.2	3.0	7.0	1.1	8.0	3.3	26.4	.7	.6	1.4	69.4	69.0	15.5	111.9	87.9	223.7	207.0	84.1	73.8	63.8	17.9	88.3
Washington:																									
1936	11.7	43	15	5.3	.8	2.7	1.6	.7	.2	28.8	.8	2.0	1.7	50.4	132.0	24.5	128.8	103.8	303.3	272.4	79.0	70.3	65.2	2.4	75.3
1935	11.2	44	15	5.7	.8	1.6	1.3	2.2	.8	17.1	.7	2.0	2.2	52.2	133.2	21.9	120.2	99.1	293.6	268.2	62.4	52.6	65.3	3.2	79.9
West Virginia:																									
1936	10.3	64	31	6.2	3.4	1.8	1.5	3.7	4.5	32.4	1.1	.7	5.7	53.3	68.6	13.9	98.0	77.2	185.3	166.9	106.7	98.3	79.2	23.3	68.8
1935	9.9	63	31	5.3	4.6	8.4	4.0	8.9	6.3	33.4	.5	.7	3.6	58.8	69.4	12.5	89.0	69.4	156.4	141.9	91.1	83.6	75.5	18.8	69.5
1934	9.6	69	32	5.7	5.9	3.3	3.3	11.4	4.7	27.1	1.1	.4	2.0	52.5	63.0	9.8	99.5	78.0	139.9	120.0	85.8	76.9	77.2	26.1	62.3
Wisconsin:																									
1936	11.5	47	17	4.1	.4	.5	5.1	1.6	.4	14.8	(³)	.6	1.0	37.0	133.6	29.1	(²)	100.7	(²)	291.5	(²)	72.4	(²)	6.0	71.3
1935	10.4	46	17	3.9	.2	3.2	4.0	1.9	.5	22.2	.2	1.0	1.4	37.7	129.4	25.7	(²)	88.4	(²)	252.4	(²)	64.5	(²)	4.9	69.4
1934	10.4	51	19	4.1	.7	2.9	1.6	4.1	.9	12.6	.5	.5	.6	40.3	127.1	24.8	(²)	88.0	(²)	238.8	(²)	70.3	(²)	7.1	69.7

² Data not available. ³ No deaths. ⁴ January to August only.

SALIENT PUBLIC HEALTH FEATURES OF RHEUMATIC HEART DISEASE [1]

By O. F. Hedley, *Passed Assistant Surgeon, United States Public Health Service*

The object of this article is to summarize the public health aspects of rheumatic heart disease. Rheumatic fever is not included in the very useful synopsis on the control of communicable diseases prepared by a committee of the American Public Health Association (*1*) probably because of lack of an objective method of diagnosis and administrative control. However, the arrangement and order of items under each disease employed by that committee will be followed in this article, although modified to fit the disease under discussion.

One of the chief difficulties lies in the confusing terminology so generally used. "Rheumatic fever" and "rheumatic infection" are here used to describe the generalized infection, while "rheumatic heart disease" or "rheumatic carditis" describe the cardiac involvement.

Rheumatic heart disease should not be looked upon as a *complication* of rheumatic fever but as its *chief manifestation* (*2*). Were it not for the resultant heart disease, rheumatic fever would be a much less important problem. Joint affections may be absent or result in varying degrees of temporary disability. Rheumatic heart disease is an important cause of acute and chronic disability, invalidism, and early death.

Definitions.—Rheumatic fever is an infectious disease of unknown etiology manifested by proliferative and exudative involvement of endothelial and subendothelial tissues, although other structures may also be involved. It has a predilection for the heart, joints, brain, fascia, subcutaneous tissues, and visceral cavities. Evidences of generalized toxemia are common. Its clinical manifestations are protean, depending on the severity of the infection and the organs and tissues involved. Although single attacks occur, the tendency is toward chronicity. No known type of immunity is conferred by an attack. With each period of activity the heart is usually further damaged.

Rheumatic heart disease is a proliferative and exudative involvement of the valves, endocardium, conduction tissues, myocardium, and pericardium in varying degrees and extent, occurring as the chief manifestation of rheumatic fever. In the acute stage it is an inflammation. In its chronic form it is characterized by sclerosis, resulting in valvular deformities as typified by mitral stenosis, myocardial fibrosis, and adherent pericardium.

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[1] From the Office of Heart Disease Investigations, U. S. Public Health Service, Maloney Clinic Building, University of Pennsylvania, Philadelphia.

1. *Recognition of the disease.*[2]—Owing to its multiform clinical manifestations, rheumatic fever may be quite easy or extremely difficult to recognize. Polyarthritis with a rapidly progressive pancarditis is not usually difficult to diagnose. Comparatively few cases fall in this category. Joint manifestations are usually minimal and are frequently absent.

The disease tends to become a smoldering low-grade infection, with periods of reactivation or recrudescences. These are characterized by slowly progressive cardiac involvement, indefinite joint, muscle, or "growing" pains, choreic manifestations, loss of weight or failure to gain, pallor out of proportion to the moderate degree of secondary anemia, slight temperature elevation, tachycardia best indicated by an elevated "sleeping pulse", nosebleeds, vomiting, abdominal distress at times severe enough to be mistaken for appendicitis, subcutaneous nodules, and increased leukocyte count and erythrocyte sedimentation rate. The recognition of these signs of activity is of paramount importance in the diagnosis and management of this disease. Reactivation may follow colds, sinusitis, pharyngitis, tonsillitis, and other intercurrent infections, or may occur without any demonstrable antecedent factor.

In adults the joint manifestations of rheumatic fever are usually more pronounced than in children and the cardiac involvement is not so severe.

The diagnosis of chronic rheumatic heart disease depends upon eliciting physical signs characteristic of valvular lesions and adherent pericardium. The X-ray is a valuable adjunct, and the electrocardiograph is sometimes of indirect assistance. Histories of rheumatic fever or chorea can be obtained in only 50 to 75 percent of cases. A negative history, however, does not invalidate the diagnosis. The presence of auricular fibrillation or subacute bacterial endocarditis should excite suspicion of a rheumatic background.

Practically all valvular disease in persons under 30 years of age is due to rheumatic heart disease. Mitral stenosis is the most typical rheumatic lesion and is apparently due to no other cause. Mitral insufficiency with or without mitral stenosis, aortic insufficiency, and stenosis are frequently noted. Mitral valvular disease is the most common. Affections of other valves or of the pericardium are usually found in combination with mitral involvement. While evidence of tricuspid valvular disease is not infrequently found on post-mortem examinations, it is difficult to recognize clinically. Pulmonic valvular involvement is rare.

Functional murmurs, congenital cardiovascular defects, sclerotic valvular diseases, and syphilitic aortitis with aortic valvular insufficiency must be ruled out.

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[2] The paragraph numbers and headings correspond with those in the report of the Committee of the American Public Health Association on The Control of Communicable Diseases (*1*).

2. *Etiological agent.*—Unknown. Generally ascribed either to various forms of streptococci or to filterable viruses.

3. *Source of infection.*—Probably from discharges of the upper respiratory tract.

4. *Mode of transmission.*—Although difficult to determine in many cases, there is considerable evidence that rheumatic infection is transmitted from person to person. The incidence of multiple cases in families equals that of tuberculosis (*3*) (*4*). Localized epidemics in schools, colleges, military organizations, and hospitals have been reported. Waves of rheumatic activity in cardiac hospitals are not infrequent.

5. *Incubation period.*—Unknown.

6. *Period of communicability.*—Unknown.

7. *Susceptibility and immunity.*—While even intrauterine infection has been noted, the disease is infrequent under 3 years. Greatest frequency from 7 to 10 years, the peak incidence of initial cases occurring at about 7 years (*5*) (*6*). Diminished initial case incidence after puberty. While first attacks are not infrequent among adults, a careful history often reveals previous rheumatic infection in childhood.

An attack of rheumatic fever results in increased susceptibility to further attacks. In children under 10 years of age subsequent attacks occur in approximately 80 percent of cases.

8. *Prevalence.*—

A. Found only in human beings. Has not been experimentally transmitted.

B. Most frequent in cooler regions of the temperate zones. Infrequent in the tropics. Incidence higher in the Northern States, especially in New England, than in the South. Little difference in incidence in seaboard and inland areas of similar latitudes. Altitude unimportant except as it influences temperature. Rainfall not important factor. Proximity of dwellings to bodies of water of doubtful significance.

C. Slightly more frequent in females.

D. More common in whites than Negroes. Nationality probably unimportant.

E. Found more in urban than rural populations. Especially common among the industrial population of large cities.

F. More frequent among the poor than the well-to-do; cannot, however, be strictly regarded as a disease of poverty.

G. Malnutrition and poor living conditions predispose to rheumatic infection. No evidence that the disease is markedly influenced by lack of vitamins.

H. Incidence: Rheumatic heart disease accounts for 15 to 40 percent of clinical heart disease in the United States, depending

on the locality. The writer found that 13 percent (*7*) of the deaths from heart disease in Washington (D. C.) hospitals during 1932 was due to this cause. Owing to its extreme chronicity, it is expected that the percentage of heart disease due to rheumatic infection among series of fatal cases is less than that among clinical cases. Paul (*8*) estimated that there are 840,000 cases in the United States. The importance of this form of heart disease lies in the fact that it accounts for 90 percent of the heart disease under 30 years of age. School surveys indicate that from 0.5 to 4.0 percent of children show evidence of rheumatic heart disease. It is the type of heart disease causing the largest number of rejections for life insurance and military service. During the World War 26 persons in 1,000 were rejected in the draft for heart disease, mostly rheumatic heart disease. It results in maiming and death during the period of greatest social and economic usefulness. Due to its extreme chronicity, it results in varying degrees of disability over a longer period than any other kind of heart disease. The average age at death is about 30 years. In the northern part of the United States it is the third most important chronic infectious disease, exceeded only by tuberculosis and syphilis.

9. *Methods of control.*—The prevention of a disease is usually dependent on adequate knowledge concerning its etiologic agent, mode of transmission, and a reliable objective clinical, serological, or roentgenological basis for its diagnosis. In the case of a disease of childhood, a test for determining susceptibility is highly desirable. None is at present available for rheumatic fever. The following is presented with these limitations in mind and with the desire to utilize existing information to combat this disease.

A. The infected individual, contacts, and environment:

1. Recognition of disease: Clinical symptoms and signs of rheumatic fever and rheumatic heart disease. Its insidiousness and protean manifestations must ever be kept in mind.

2. Reporting: Due to lack of satisfactory criteria, it is doubtful whether rheumatic fever morbidity should be made reportable except for research purposes. While rheumatic heart disease is more easily diagnosed, most cases seen on routine examinations are inactive, and little would be gained by reporting them other than for special studies.

Deaths from rheumatic heart disease are not tabulated as an entity but are listed under rheumatic fever and various forms of heart disease. For this reason it is difficult to determine specific death rates and trends in this disease. Physicians should be encouraged to report rheumatic heart disease deaths according to etiology. The International List of Causes of Death should be revised to permit proper compilation of the reported mortality (*9*).

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3. Isolation: Cases showing evidence of rheumatic activity should be separated at least to the extent of avoiding intimate contact with their fellows. Due to the close association between various forms of sore throat and rheumatic fever, persons suffering from acute or chronic tonsillitis and other respiratory infections should avoid close contacts with rheumatic subjects. Physicians, nurses, teachers, and other attendants with upper respiratory infections should not be assigned to duty among rheumatic cardiac patients. Visitors with these conditions should be refused permission to see patients. Similarly, persons with upper respiratory infections and those with active rheumatic infections should avoid close relations with other persons, especially with young children. These precautions are suggested as it has been noted that a high proportion of both first attacks of rheumatic fever and recrudescences of the infection are initiated or shortly preceded by attacks of upper respiratory infection.

4. Concurrent disinfection: Due to extreme chronicity strict concurrent disinfection appears impracticable. Reasonable care is urged.

5. Terminal disinfection: None.

6. Quarantine: None.

7. Immunization: None.

8. Investigation of source of infection: Due to the high incidence of more than one case in a family, efforts should be made by the attending physician to ascertain whether there are rheumatic stigmata among other members. While it is usually difficult to determine a sequence of events leading to the cases under consideration, much can be done by this method to bring other members of the family under medical care.

B. General measures:

1. The realization by all concerned that any kind of joint or "growing" pains in children is potentially serious and demands careful investigation. The nervous or fidgety child should be examined for chorea.

2. Diseased tonsils should be thoroughly removed as soon as is safely possible. Tonsillectomies should be performed when there is a history of repeated sore throats even though the tonsils appear normal on examination. The routine removal of healthy tonsils is not recommended. The early removal exerts a beneficial influence on the incidence and severity of rheumatic heart disease. Kaiser (*10*) noted among 48,000 school children that 34 percent fewer children had histories of rheumatic infection when tonsillectomies had been performed. In a clinical study of 1,200 rheumatic children the advantage in favor of tonsillectomies was

reduced to slightly less than 10 percent when compared with the expected rate of rheumatic infection among previously tonsillectomized children (*11*). Kaiser believes that these figures represent the minimum and maximum benefits of tonsillectomy in the prevention of rheumatic infection and that the probable advantage is about 15 to 20 percent in favor of previously tonsillectomized children (*12*). He also noted that the more severe forms of carditis were less frequent and that, consequently, the mortality was reduced about one-half among children tonsillectomized previous to the onset of rheumatic infection. Mackie observed that tonsillar infection was twice as frequent among rheumatic children as among normal controls (*13*).

Tonsillectomies should not be regarded as a specific method for prevention and too much should not be expected in a given case. It is only in the aggregate that the benefit becomes apparent.

In well advanced cases of rheumatic heart disease the removal of tonsils is recommended as a general hygienic measure and to reduce upper respiratory infections. It is doubtful whether the ultimate prognosis is greatly affected.

3. The school medical examination should be better utilized as a measure against rheumatic heart disease. *All pupils should be stripped to the waist for physical examination.* A careless examination is worse than useless, as it may result in a sense of false security. To many uneducated persons, "the doctor says" is sufficient.

School nurses and teachers should be trained to be on the alert for the more easily detectable evidence of rheumatic infection and to report such cases to the school physician for further examination. Cases with rheumatic activity should be excluded from school. Treatment should be carried out by the family physician or suitable clinic.

4. School authorities should cooperate in the management of the disease insofar as it pertains to school life. Special schools or classes for rheumatic cardiacs are not, in general, recommended; the psychological effect is bad. Furthermore, it is sometimes detrimental to these children to transport them long distances to a special school; it is better to enroll them in schools near their homes and to limit their activities according to their functional capacity. Special provision should be made for rest periods, the privilege of riding elevators, avoidance of harmful exertion, and reduction in the amount of school work carried. Arrangements should be made for supplemental feeding as needed. Teachers and school nurses should be instructed to screen out cases not doing well for further examinations by the school physicians.

5. School medical authorities, including college health services, should assist in the vocational guidance of persons with rheumatic heart disease. They should be tactfully advised against planning careers which they have little chance of consummating.

6. Candidates for athletic teams should be subjected to a careful physical examination at the beginning of each practice season. Those with organic heart disease should not be permitted to engage in strenuous competitive athletics. Candidates with possible or potential heart disease should be given a complete cardiac survey by a competent specialist. In case of doubt it is better to err on the side of conservatism and refuse permission to play. On the other hand, it is unfair to deprive a person of the pleasure of athletics and possibly develop a cardiac neurosis because of some inconsequential finding.

7. Convalescent cardiac hospitals where patients with rheumatic fever are treated in a manner similar to that followed in pulmonary tuberculosis have never been developed on a sufficient scale to determine their value. It is estimated that there should be 6 to 8 beds per 100,000 population devoted to this purpose. Few cities have any facilities for the care of these patients. These hospitals are so crowded with far advanced cases of rheumatic heart disease requiring domiciliary care that few beds are devoted to children convalescing from rheumatic fever with little or no evidence of heart disease. Aside from the humanitarian aspects, these institutions almost invariably serve as research and teaching centers and should be encouraged for this reason.

8. During the past few years much has been written about sending rheumatic fever patients to warm climates. While this is helpful in limited cases, it does not appear practicable on a large scale. Care should be exercised in selecting the locality, providing proper medical care, and determining in advance that these patients will not become a burden on the Southern States. One should be prepared to maintain the patient there for a long period, preferably several years.

9. It is a mistake to consider rheumatic cardiac patients in the same category as those afflicted with disabilities of locomotion. The motor cripple, with the exception of the patient with bone and joint tuberculosis, usually represents an end result. In fact, varying degrees of return of function can be expected. On the other hand, the rheumatic cardiac subject is liable to reactivation resulting in further cardiac damage.

10. The management of rheumatic infection depends largely upon the recognition of activity outlined in section 1. Patients should be kept in bed for some time after all evidences of activity

have subsided. When the patient is underweight, efforts should be made to correct it by a suitable diet. This should be well-balanced from the standpoints of protein, fat, and carbohydrate intake and the accessory vitamins. Secondary anemia is a prominent symptom in many cases and must be treated with iron and in some cases by blood transfusions. The patient's mode of living has to be regulated to fit the cardiac reserve. Salicylates are of value in controlling the arthritic manifestations but have little effect on cardiac involvement. When congestive failure supervenes, it must be treated by appropriate measures.

11. In view of the high incidence of this disease among the lower economic groups, especially in large cities, it is doubtful whether much can be accomplished without a betterment of living conditions. It is confidently felt that better housing, the provision of proper food and clothing, adequate medical care, and other measures to promote child welfare will be reflected in a lower incidence of this disease.

ACKNOWLEDGMENT

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CONTROL OF CHROMIC ACID MISTS FROM PLATING TANKS[1]

By EDWARD C. RILEY, *Assistant Public Health Engineer*, and F. H. GOLDMAN, *Associate Chemist, United States Public Health Service*

Since the investigation of the health hazards in chromium plating by Bloomfield and Blum (*1*) in 1928, chromium plating has been widely used in industry where a brilliant luster and a hard corrosion-resisting surface are desired. In almost every case a cross-draft ventilation system has been utilized to remove the mists and fumes, but few data regarding the effectiveness of this type of exhaust are available. By measuring the air velocity and sampling the air in a chromium plating shop, an attempt has been made here to evaluate the control with reference to the standards recommended in 1928 (*1*).

Three instruments were used to measure the velocity at the face of the exhaust hood. The kata thermometer and anemometer were used to check the newer and more convenient Alnor velometer. An additional check was obtained by measuring the static suction on the hood.

Air samples were collected by the modified Greenburg-Smith impinger (*2*) at the rate of 1 cubic foot per minute. A 5 percent solution of sodium carbonate (Na_2CO_3) was used as a collecting medium.

Where low concentrations were encountered, samples were taken for several hours, while much shorter sampling periods sufficed for heavy concentrations such as were encountered when no local exhaust was used. In every case the impinger flask was attached directly over the edge of the tank so that the air intake was about 1 foot above the side of the tank and 1½ feet above the solution in the plating tank. When a man is working over the plating tank he breathes air from about this level and should be subjected to the concentrations obtained by this sampling technique.

Two samples were collected simultaneously, the suction being produced by two Hancock air ejectors operated by compressed air at 50 to 60 pounds per square inch. The flow was regulated by orifices calibrated to give 1 cubic foot per minute.

The amount of chromic acid in these samples was determined by the iodometric method (*1*). The samples were acidified with sulphuric acid, potassium iodide was added, and then the samples were titrated with 0.01 N sodium thiosulphate, using starch as an indicator.

Table 1 summarizes the results obtained. All tests were made using current densities of 150 to 200 amperes per square foot of surface area.

Although adequate control was maintained when velocities of about 1,500 and 2,000 feet per minute were created at the face of the

[1] From Laboratory of Industrial Hygiene, U. S. Public Health Service.

hood, when the velocity was reduced to about one-third the control was unsatisfactory. With no exhaust the general atmosphere becomes polluted even in a large shop with good general ventilation. In this case, the concentrations to which the operator would be exposed are decidedly unpleasant and may produce irritation (*1*).

With adequate exhaust ventilation there is little difference between the operator's exposure and the general atmosphere, whereas the operator is exposed to greater pollution when no local exhaust is utilized.

For control purposes the velocity at the point of generation of the mist or fumes is the most important single factor. Using the equation $Q=100L\times W$, where Q=capacity in cubic feet per minute, L=length of tank in feet, and W=width of tank in feet, the capacity of the exhaust system may be roughly computed (*3*).

Since the mist originates at the cathode and anode, which are usually at a distance from the face of the hood, the quantity (Q) seems a better criterion than the face velocity. A value of $Q=50\ L\times W$ is suggested for each hood, since in good practice there are usually two hoods, one on each of the long sides of the tank. The use of the equation given checks with values found in systems known to operate successfully.

SUMMARY

In large rooms with good general ventilation alone, the atmosphere near chromium plating tanks may contain concentrations of chromic acid greater than 1 milligram per 10 cubic meters, which has been taken as the safe limit (*1*). With a cross-draft local-exhaust system it is possible to keep the concentration down to less than this limit.

RECOMMENDATIONS

For the standard type of plating tank, a cross-draft exhaust system satisfying the equation $Q=100\ L\times W$ has been found adequate.

Previous recommendations suggested by Bloomfield and Blum (*1*) have been confirmed and are again emphasized.

TABLE 1.—*Summary of results*

Concentration of CrO_3, mg per 10 cubic meters	Number of samples	Size of tanks $L\times W$ (feet)	Local exhaust ventilation, cubic feet per minute	Cubic feet per minute per foot of slot	Approximate velocity at face of hood	Remarks
0.33	1	5×5	2,500	250	2,000	Exhaust on 2 sides.
0.34	2	20×4	9,000	225	1,800	Exhaust on 2 long sides.
11.2	2	20×4	3,000	75	600	Do.
36.8	2	20×4	None			General ventilation good.
28.0	1	20×4	do			Strong breeze outside causing exceptionally good general ventilation.
27.8	1	5×5	do			
0.26	1		On full			General air near tanks.
5.82	1		None			General air near tanks. Natural ventilation good.

REFERENCES

(1) Bloomfield, J. J., and Blum, William: Health hazards in chromium plating. Pub. Health Rep., 43: 2330 (Sept. 7, 1928). Reprint No. 1245.
(2) Hatch, T., Warren, H., and Drinker, P.: Modified form of the Greenburg-Smith impinger for field use, with a study of its operating characteristics. J. Ind. Hyg., 14:301–311 (October 1932).
(3) Bloomfield, J. J., and Dalla Valle, J. M.: The determination and control of industrial dust. Pub. Health Bull. No. 217, U. S. Public Health Service. Gov't Printing Office, 1935.

FIVE HUNDRED CASES OF SCARLET FEVER CAUSED BY USE OF RAW MILK FROM INFECTED COW—A CORRECTION

In the report of the epidemic of scarlet fever caused by the use of raw milk from an infected cow, published in the PUBLIC HEALTH REPORTS for January 22, 1937, page 113, the outbreak was stated to have occurred in Oswego, N. Y. This was an error; it occurred in Owego, Tioga County.

DEATHS DURING WEEK ENDED JANUARY 16, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 16, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	11,152	9,440
Average for 3 prior years	9,787	
Total deaths, first 2 weeks of year	22,555	19,591
Deaths under 1 year of age	642	569
Average for 3 prior years	631	
Deaths under 1 year of age, first 2 weeks of year	1,361	1,183
Data from industrial insurance companies:		
Policies in force	69,211,701	67,939,756
Number of death claims	15,652	14,700
Death claims per 1,000 policies in force, annual rate	11.8	11.3
Death claims per 1,000 policies, 2 weeks of year, annual rate	11.3	10.9

MORTALITY SUMMARY FOR LARGE CITIES, 1936

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 53-week period Dec. 30, 1935, to Jan. 2, 1937, and comparison with 1935

[From the Weekly Health Index, Bureau of the Census, Department of Commerce]

City	Provisional mortality figures for year 1936				Final mortality figures for calendar year 1935			
	Total deaths [1]	Death rate (per 1,000 estimated population) [2]	Deaths under 1 year [1]	Infant mortality rate [3] [4]	Total deaths	Death rate (per 1,000 estimated population)	Deaths under 1 year	Infant mortality rate [3]
Total (86 cities)	458,754	12.3	29,424	51	427,736	11.4	31,229	54
Akron	2,241	8.4	190	47	2,207	8.2	196	48
Albany	1,970	15.0	131	54	2,016	15.3	109	47
Atlanta	4,910	17.1	427	75	4,340	15.0	408	74
Baltimore	11,684	14.2	898	67	11,149	13.5	774	56
Birmingham	3,859	13.6	396	83	3,348	11.8	316	64
Boston	11,670	14.8	824	53	11,469	14.5	814	51
Bridgeport	1,720	11.7	100	39	1,581	10.7	78	30
Buffalo	7,760	13.1	478	49	7,187	12.1	524	52
Cambridge	1,458	12.8	103	49	1,426	12.4	127	57
Camden	1,652	13.9	155	51	1,591	13.3	170	58
Canton	1,173	10.7	112	52	1,200	10.9	98	53
Chicago	38,610	10.8	1,889	40	35,431	9.9	1,994	40
Cincinnati	7,506	16.2	480	61	7,105	15.2	468	61
Cleveland	10,770	11.6	598	42	9,986	10.7	640	44
Columbus	4,784	15.8	290	59	4,406	14.5	267	55
Dallas	3,689	12.7	365	72	3,148	10.8	373	73
Dayton	2,909	13.9	205	52	2,656	12.6	159	47
Denver	4,653	15.7	320	63	4,369	14.7	334	60
Des Moines	1,826	12.4	86	29	1,916	13.0	125	43
Detroit	15,031	8.4	1,398	53	13,644	7.6	1,173	45
Duluth	1,206	11.8	56	32	1,157	11.3	48	29
El Paso	1,433	13.2	218	83	1,455	13.3	282	104
Erie	1,542	12.8	79	34	1,280	10.6	86	41
Evansville	1,642	15.3	110	64	1,269	11.8	92	58
Fall River [5]	1,639	14.3	87	45	1,460	12.7	114	57
Flint	1,438	8.2	208	57	1,389	7.9	175	51
Fort Wayne	1,338	10.9	72	35	1,298	10.5	69	33
Fort Worth	2,200	12.7	172	61	1,913	11.0	176	64
Grand Rapids	1,756	10.0	117	45	1,756	9.9	153	57
Hartford	2,213	12.9	153	66	2,252	13.1	172	47
Houston	4,333	12.8	350	68	3,763	11.1	325	58
Indianapolis	5,843	15.5	378	65	5,293	14.0	390	66
Jersey City	3,622	11.3	238	36	3,490	10.8	273	41
Kansas City, Kans	1,937	15.6	146	80	1,676	13.4	127	52
Kansas City, Mo	5,745	13.6	320	55	5,032	11.9	334	58
Knoxville	1,555	13.6	193	82	1,420	12.4	154	72
Long Beach	1,636	9.7	87	36	1,524	9.0	83	38
Los Angeles	17,001	11.8	994	57	16,112	11.1	892	53
Louisville	4,165	13.5	237	46	4,483	14.5	269	54
Lowell [5]	1,393	14.0	88	73	1,316	13.1	115	68
Lynn	1,070	10.4	30	23	1,013	9.8	100	71
Memphis	4,817	18.0	452	92	4,403	16.4	418	90
Miami	1,672	15.2	106	50	1,544	14.0	121	63
Milwaukee	5,480	9.0	431	45	5,087	8.3	414	46
Minneapolis	5,830	12.0	301	39	5,121	10.5	316	43
Nashville	3,025	19.2	259	69	2,733	17.3	252	76
New Bedford [5]	1,339	12.0	107	62	1,267	11.3	97	56
New Haven	2,191	13.5	66	31	2,170	13.3	125	41
New Orleans	8,905	18.6	833	93	7,924	16.5	691	77
New York	78,803	10.8	4,545	46	75,080	10.2	4,807	48
Bronx Borough	12,220	8.6	641	42	11,429	8.0	718	45
Brooklyn Borough	26,520	9.8	1,691	43	25,798	9.4	1,818	45
Manhattan Borough	28,501	16.5	1,697	54	27,539	15.9	1,683	53
Queens Borough	9,141	7.2	431	41	8,089	6.4	480	46
Richmond Borough	2,421	14.2	85	37	2,225	13.0	108	45
Newark, N. J	5,158	11.5	319	44	4,792	10.6	389	51
Oakland	3,661	12.0	183	45	3,529	11.5	171	42
Oklahoma City	2,471	11.5	169	44	2,254	10.5	242	64
Omaha	3,203	14.6	223	53	2,878	13.0	181	42
Paterson	1,782	12.9	114	44	1,684	12.1	105	42
Peoria	1,610	14.2	143	60	1,417	12.4	104	54

See footnotes at end of table.

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 53-week period Dec. 30, 1935, to Jan. 2, 1937, and comparison with 1935—Continued

City	Provisional mortality figures for year 1936				Final mortality figures for calendar year 1935			
	Total deaths[1]	Death rate (per 1,000 estimated population)[2]	Deaths under 1 year[1]	Infant mortality rate[3, 4]	Total deaths	Death rate (per 1,000 estimated population)	Deaths under 1 year	Infant mortality rate[3]
Philadelphia	25,459	12.8	1,411	47	24,118	12.1	1,453	49
Pittsburgh	9,146	13.4	636	51	8,404	12.3	614	50
Portland, Oreg	4,279	13.6	166	38	4,020	12.7	142	34
Providence	3,340	13.0	209	40	3,166	12.3	213	41
Richmond	3,281	17.7	236	77	2,941	15.8	240	79
Rochester	4,060	12.1	198	40	3,640	10.8	229	46
St. Louis	12,549	15.1	422	34	10,533	12.6	666	52
St. Paul	3,235	11.5	149	30	3,113	11.0	177	37
Salt Lake City	1,802	12.3	144	41	1,806	12.3	174	50
San Antonio	3,772	15.6	623	108	3,251	13.4	532	96
San Diego	2,489	14.7	141	46	2,281	13.4	111	39
San Francisco	9,162	13.6	291	41	8,502	12.6	252	35
Schenectady	1,051	10.9	64	46	1,088	11.2	66	46
Seattle	4,979	13.1	173	35	4,623	12.1	203	41
Somerville	983	9.2	45	38	862	8.0	42	35
South Bend	917	8.1	62	40	991	8.7	100	63
Spokane	1,684	14.4	125	57	1,721	14.6	112	54
Springfield, Mass	1,891	12.2	129	54	1,747	11.2	134	52
Syracuse	2,494	11.4	163	45	2,428	11.1	168	47
Tacoma	1,614	14.8	71	39	1,436	13.1	66	36
Tampa	1,326	12.0	80	50	1,283	11.6	94	57
Toledo	3,888	12.8	220	47	3,591	11.8	241	54
Trenton	1,936	15.6	133	55	1,768	14.2	127	54
Utica	1,427	13.9	86	45	1,531	14.8	91	51
Washington, D. C	9,217	18.7	848	72	8,483	17.1	642	59
Waterbury	899	8.8	74	54	1,061	10.4	67	37
Wilmington, Del.[5]	1,514	14.3	108	51	1,484	13.9	133	59
Worcester	2,699	13.5	171	51	2,503	12.5	160	48
Yonkers	1,201	8.3	82	48	1,111	7.6	61	35
Youngstown	1,931	10.9	130	43	1,841	10.4	117	42

1 Based upon telegraphic reports received each week from city health officers.
2 Rates on the basis of a calendar year.
3 The infant mortality rate is the number of deaths under 1 year of age per 1,000 live births.
4 Provisional rate is computed from deaths under 1 year as reported each week and estimated live births for 1936.
5 Mortality rates based upon population Apr. 1, 1930, decreased 1920 to 1930; no estimate made.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 22, 1937, and January 25, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 23, 1937, and Jan. 25, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936
New England States:								
Maine	2	1	204	40	96	195	1	0
New Hampshire	1	3	3		22	81	0	0
Vermont					5	121	0	0
Massachusetts	3	8			1,074	344	1	4
Rhode Island	1		4		188	120	0	0
Connecticut	8	2	1,152	18	307	87	0	3
Middle Atlantic States:								
New York	42	50	[1] 432	[1] 21	280	916	17	22
New Jersey	8	14	356	11	467	33	5	3
Pennsylvania	61	41			90	518	6	6
East North Central States:								
Ohio	41	27	115	7	39	60	6	9
Indiana	20	30	307	47	8	165	3	4
Illinois	23	48	486	22	26	47	8	12
Michigan	23	11	139	4	50	52	5	6
Wisconsin	3	1	2,462	53	24	74	1	5
West North Central States:								
Minnesota		4	11		25	104	0	2
Iowa	5	17	1,564	7	3	5	0	2
Missouri	15	31	1,624	214	8	21	0	2
North Dakota	1	8	460	16	1	4	1	0
South Dakota		9	266		2	14	2	0
Nebraska		9	94		3	56	0	0
Kansas	7	17	4,988	25	3	41	0	1
South Atlantic States:								
Delaware	1		32		138	113	0	0
Maryland [2]	7	7	416	15	253	137	7	9
District of Columbia	9	31	143	4	31	9	4	3
Virginia	25	44			188	34	7	2
West Virginia	6	20	900	61	17	4	6	1
North Carolina [2]	29	31	62	11	59	21	1	6
South Carolina [3]	13	3	861	391	9	3	5	1
Georgia [3]	11	18	470	193			4	0
Florida	8	5	50	1	6	3	10	0
East South Central States:								
Kentucky [4]		15		33		5		3
Tennessee	20	24	746	122	15	25	6	9
Alabama [3]	14	23	399	302	2	19	1	2
Mississippi [2] [3]	6	9					1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 23, 1937, and Jan. 25, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936
West South Central States:								
Arkansas	8	13	651	94		2	1	5
Louisiana	27	19	193	6	4	56	5	0
Oklahoma [5]	4	10	485	183	8		6	8
Texas [3]	67	64	2,421	347	442	53	5	23
Mountain States:								
Montana		6	2,706	57	3	54	0	0
Idaho		1	843	2	71	90	0	0
Wyoming					1	1	0	1
Colorado	3	9			8	8	0	1
New Mexico		8	331	3	32	4	1	0
Arizona	7	3	747	92	172		2	0
Utah [2]	1		70		16	2	0	0
Pacific States:								
Washington	2		226		29	193	1	1
Oregon		2	2,824	16	14	674	0	2
California	42	44	6,210	129	82	987	1	8
Total	564	735	35,953	2,547	4,306	5,505	130	167
First 3 weeks of year	1,917	2,301	71,368	8,115	12,549	15,592	431	538

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936
New England States:								
Maine	0	0	18	23	0	0	21	0
New Hampshire	0	0	4	18	0	0	0	0
Vermont	0	0	1	11	0	0	0	0
Massachusetts	1	1	235	280	0	0	0	1
Rhode Island	0	0	43	18	0	0	0	1
Connecticut	0	0	99	63	0	0	8	0
Middle Atlantic States:								
New York	1	1	783	899	18	0	5	8
New Jersey	0	0	131	243	0	0	0	8
Pennsylvania	0	1	641	620	0	0	6	4
East North Central States:								
Ohio	2	0	289	307	8	3	2	0
Indiana	0	0	164	301	4	0	1	0
Illinois	1	0	466	584	26	17	8	11
Michigan	0	0	659	816	0	0	2	7
Wisconsin	0	0	339	598	15	33	1	2
West North Central States:								
Minnesota	3	0	141	353	9	15	0	6
Iowa	0	0	165	203	12	20	1	0
Missouri	0	1	206	210	75	3	1	4
North Dakota	0	0	21	79	15	7	0	0
South Dakota	0	0	87	71	0	9	0	0
Nebraska	0	0	67	163	13	28	0	6
Kansas	0	1	256	213	26	9	0	0
South Atlantic States:								
Delaware	0	0	4	14	0	0	0	1
Maryland [3]	0	0	72	94	0	0	8	2
District of Columbia	0	0	18	19	0	0	1	0
Virginia	0	0	26	54	0	0	7	7
West Virginia	1	0	56	36	0	2	1	4
North Carolina [3]	1	2	35	50	0	0	1	5
South Carolina [3]	1	0	7	10	0	0	1	1
Georgia [3]	3	1	36	29	0	1	7	1
Florida	0	0	5	13	0	0	0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 23, 1937, and Jan. 25, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936	Week ended Jan. 23, 1937	Week ended Jan. 25, 1936
East South Central States:								
Kentucky [4]	....	0	....	67	....	0	....	4
Tennessee	1	0	30	43	0	0	4	2
Alabama [3]	1	3	9	13	0	0	3	3
Mississippi [2 3]	0	0	9	11	1	0	1	0
West South Central States:								
Arkansas	1	0	11	6	0	0	8	1
Louisiana	2	1	15	81	0	0	5	1
Oklahoma [5]	2	0	25	48	0	1	1	1
Texas [3]	0	0	107	110	1	1	11	5
Mountain States:								
Montana	0	0	66	189	12	10	0	1
Idaho	0	0	24	69	8	3	0	0
Wyoming	0	0	8	79	17	0	0	0
Colorado	0	0	19	174	1	4	0	1
New Mexico	0	0	23	41	0	0	3	2
Arizona	0	0	24	47	0	0	0	0
Utah [2]	0	0	31	91	0	0	0	1
Pacific States:								
Washington	1	0	45	74	4	15	0	0
Oregon	1	0	29	77	8	4	0	0
California	1	1	270	349	10	0	5	4
Total	24	13	5,819	7,411	278	185	113	101
First 3 weeks of year	72	58	17,256	22,217	869	701	389	335

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 23, 1937, 36 cases, as follows: North Carolina, 1; South Carolina, 4; Georgia, 16; Alabama, 4; Mississippi, 1; Texas, 10.
[4] Report for week ended Jan. 23, 1937, not received.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1936										
Hawaii Territory	....	8	506	....	390	....	1	1	0	1
Missouri	14	132	273	28	18	....	22	431	22	85
December 1936										
California	24	269	377	5	140	7	32	1,350	28	56
Georgia	12	123	522	359	7	17	12	164	3	26
Hawaii Territory	1	15	18	....	1,153	....	0	0	0	7
Iowa	8	14	70	....	12	....	2	441	50	9
Louisiana	4	82	60	40	20	2	4	62	1	28
Maryland	15	61	75	....	544	....	2	324	0	19
Michigan	11	98	20	5	137	....	7	1,752	1	39
Minnesota	5	57	5	....	107	....	1	616	38	13
Mississippi	7	46	6,044	1,784	410	155	5	63	1	10
Missouri	8	169	316	4	26	....	6	692	43	44
Nebraska	2	17	....	....	8	....	1	194	12	2
Nevada	3	....	33	....	8	....	0	34	0	0
New Mexico	1	15	19	1	134	2	3	85	0	34
New York	35	129	....	11	1,507	....	3	2,251	110	36
Ohio	32	169	119	5	87	....	16	1,293	17	29
Oklahoma [1]	12	41	348	26	29	....	11	94	3	19
Rhode Island	3	3	....	....	563	....	0	168	0	3
Vermont	....	1	21	....	4	....	0	23	0	1

[1] Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

November 1936

	Cases
Hawaii Territory:	
Chicken pox	20
Dysentery (amoebic)	2
Encephalitis, epidemic or lethargic	2
Leprosy	2
Mumps	118
Paratyphoid fever	1
Septic sore throat	1
Typhus fever	13
Whooping cough	5
Missouri:	
Chicken pox	241
Dysentery (amoebic)	15
Encephalitis, epidemic or lethargic	1
Mumps	29
Ophthalmia neonatorum	1
Rabies in animals	13
Septic sore throat	11
Trachoma	19
Tularaemia	22
Undulant fever	1
Whooping cough	81

December 1936

Actinomycosis:	
California	2
Georgia	1
Minnesota	1
Anthrax:	
New York	1
Ohio	1
Chicken pox:	
California	2,402
Georgia	101
Hawaii Territory	35
Iowa	439
Louisiana	23
Maryland	504
Michigan	2,689
Minnesota	920
Mississipppi	761
Missouri	494
Nebraska	160
Nevada	25
New Mexico	63
New York	3,198
Ohio	2,411
Oklahoma [1]	82
Rhode Island	193
Vermont	171
Conjunctivitis:	
Georgia	5
Maryland	1
Dengue:	
Georgia	5
Mississippi	2
Diarrhea:	
Maryland	16
Ohio (under 2 years, enteritis included)	17
Dysentery:	
California (amoebic)	8
California (bacillary)	20
Georgia (amoebic)	7
Georgia (bacillary)	1
Hawaii Territory (amoebic)	2
Hawaii Territory (bacillary)	1
Louisiana (amoebic)	10
Louisiana (bacillary)	3
Maryland	14
Michigan (amoebic)	2
Michigan (bacillary)	14
Minnesota (amoebic)	1
Minnesota (bacillary)	5
Mississippi (amoebic)	43
Mississippi (bacillary)	215
Missouri (amoebic)	5
New Mexico (unspecified)	12

December 1936—Continued

	Cases
Dysentery—Contd.	
New Mexico (amoebic)	5
NewMexico (bacillary)	3
New York (amoebic)	7
New York (bacillary)	53
Ohio (bacillary)	3
Oklahoma [1]	2
Rhode Island (bacillary)	2
Encephalitis, epidemic or lethargic:	
Georgia	1
Iowa	3
Louisiana	2
Maryland	1
Michigan	1
Missouri	3
Nebraska	1
New York	7
Oklahoma [1]	2
Food poisoning:	
California	34
German measles:	
California	94
Iowa	6
Maryland	26
Michigan	66
New Mexico	2
New York	98
Ohio	20
Rhode Island	6
Vermont	3
Granuloma, coccidioidal:	
California	3
Hookworm disease:	
Georgia	1,781
Louisiana	9
Mississippi	238
Oklahoma [1]	1
Impetigo contagiosa:	
Maryland	11
Jaundice (epidemic):	
California	1
Lead poisoning:	
Michigan	3
Ohio	10
Leprosy:	
Hawaii Territory	3
Louisiana	1
Mumps:	
California	2,345
Georgia	190
Hawaii Territory	56
Iowa	136
Louisiana	1
Maryland	576
Michigan	1,011
Mississippi	417
Missouri	54
Nebraska	136
Nevada	1
New Mexico	75
Ohio	139
Oklahoma [1]	6
Rhode Island	24
Vermont	86
Ophthalmia neonatorum:	
California	6
Mississippi	7
New Mexico	1
New York [2]	5
Ohio	67
Oklahoma [1]	1
Rhode Island	1
Partayphoid fever:	
California	2
Georgia	1
Louisiana	1
Maryland	4
Michigan	3
New York	8
Puerperal septicemia:	
Mississippi	28
New Mexico	3
Ohio	3

December 1936—Continued

	Cases
Rabies in animals:	
California	106
Louisiana	27
Michigan	5
Mississippi	17
Missouri	2
New Mexico	6
New York [2]	5
Rocky Mountain spotted fever:	
California	2
Scabies:	
Oklahoma [1]	4
Septic sore throat:	
California	7
Georgia	37
Iowa	1
Louisiana	2
Maryland	19
Michigan	42
Minnesota	4
Missouri	19
Nebraska	5
New Mexico	4
New York	51
Ohio	103
Oklahoma [1]	22
Rhode Island	3
Tetanus:	
California	2
Georgia	1
Louisiana	1
Michigan	1
New York	5
Ohio	3
Trachoma:	
California	7
Georgia	1
Michigan	2
Mississippi	17
Missouri	13
New Mexico	1
Ohio	3
Oklahoma [1]	3
Trichinosis:	
California	2
Maryland	1
New York	21
Tularaemia:	
California	1
Georgia	3
Iowa	6
Louisiana	8
Maryland	19
Michigan	8
Missouri	67
New York	13
Ohio	94
Oklahoma [1]	1
Typhus fever:	
California	1
Georgia	66
Hawaii Territory	6
Louisiana	2
New York	1
Undulant fever:	
California	12
Georgia	1
Iowa	9
Louisiana	5
Maryland	3
Michigan	9
Minnesota	3
Mississippi	1
Missouri	4
New Mexico	1
New York	19
Ohio	14
Oklahoma [1]	4
Vermont	1
Vincent's infection:	
Maryland	14
Michigan	32
New York [2]	61

[1] Exclusive of Oklahoma City and Tulsa.
[2] Exclusive of New York City.

Summary of monthly reports from States—Continued

December 1936—Continued	
Whooping cough:	Cases
California	1,208
Georgia	25
Hawaii Territory	8
Iowa	85
Louisiana	3
Maryland	532

December 1936—Continued	
Whooping cough—Con.	Cases
Michigan	1,308
Minnesota	203
Mississippi	235
Missouri	229
Nebraska	19
Nevada	1

December 1936—Continued	
Whooping cough—Con.	Cases
New Mexico	39
New York	1,408
Ohio	1,041
Oklahoma [1]	3
Rhode Island	84
Vermont	88

[1] Exclusive of Oklahoma City and Tulsa.
[2] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 16, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	2	0	5	6	1	0	0	0	2	34
New Hampshire:											
Concord	0	------	0	0	2	0	0	0	0	0	10
Manchester	0	------	1	0	2	3	0	0	0	0	6
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	------	------	1	1	0	0	0	0	0	2	3
Burlington	0	------	0	0	0	0	0	0	0	2	6
Rutland	0	------	0	0	1	0	0	0	0	0	8
Massachusetts:											
Boston	3	------	1	9	40	74	0	12	1	208	283
Fall River	0	------	1	3	5	4	0	3	0	0	31
Springfield	0	------	0	34	5	8	0	2	0	10	40
Worcester	0	------	0	88	23	3	0	3	0	41	73
Rhode Island:											
Pawtucket	0	------	0	0	0	2	0	0	0	0	25
Providence	1	------	0	53	13	32	0	2	0	29	88
Connecticut:											
Bridgeport	1	63	2	71	7	15	0	2	0	3	39
Hartford	0	95	0	0	7	18	0	1	0	2	39
New Haven	0	202	0	5	4	6	0	0	0	0	45
New York:											
Buffalo	0	38	4	40	26	20	0	0	0	19	154
New York	45	926	60	54	394	290	0	92	4	66	2,121
Rochester	1	6	0	2	8	6	0	3	0	16	83
Syracuse	0	------	0	10	8	26	0	0	1	29	66
New Jersey:											
Camden	3	19	5	0	3	2	0	0	1	1	43
Newark	0	102	2	153	23	16	0	8	0	24	146
Trenton	0	1	0	0	3	2	0	6	0	2	37
Pennsylvania:											
Philadelphia	6	75	15	14	40	186	0	27	2	131	541
Pittsburgh	6	107	26	4	59	51	0	9	0	40	271
Reading	0	------	1	2	6	3	0	0	0	39	37
Scranton	2	------	------	0	------	17	0	------	0	2	------
Ohio:											
Cincinnati	2	78	14	1	46	22	0	10	0	16	217
Cleveland	0	210	5	2	28	74	0	9	0	61	230
Columbus	2	6	6	2	14	9	1	0	0	6	91
Toledo	1	8	5	1	14	23	0	5	0	34	96
Indiana:											
Anderson	0	------	2	3	2	8	0	0	0	0	19
Fort Wayne	0	------	0	1	8	3	0	3	0	0	33
Indianapolis	7	------	11	3	38	29	0	5	0	10	142
Muncie	0	------	0	0	1	0	0	1	0	0	14
South Bend	0	------	0	0	6	4	0	1	0	13	20
Terre Haute	0	------	0	0	0	4	0	0	0	0	23
Illinois:											
Alton	0	------	0	0	6	8	0	0	0	0	17
Chicago	8	124	23	7	71	207	0	36	1	60	813
Elgin	0	------	0	0	3	0	0	0	0	8	11
Moline	1	22	1	0	2	0	0	0	0	2	17
Springfield	2	------	1	0	5	5	0	0	0	4	29

City reports for week ended Jan. 16, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Michigan:											
Detroit	16	120	23	6	67	337	0	20	2	69	407
Flint	1	------	1	0	6	23	0	4	0	9	30
Grand Rapids	0	8	0	2	5	16	0	0	0	19	32
Wisconsin:											
Kenosha	0	12	0	0	1	10	0	0	0	2	12
Madison	0	------	0	2	0	6	0	0	0	5	12
Milwaukee	0	11	10	3	26	33	0	3	0	22	150
Racine	0	1	1	0	1	5	0	1	0	1	18
Superior	2	------	0	0	1	10	0	0	0	8	5
Minnesota:											
Duluth	0	------	0	0	3	11	0	0	0	0	28
Minneapolis	4	13	14	3	34	25	0	2	0	10	186
St. Paul	0	7	7	4	21	18	0	1	0	27	96
Iowa:											
Cedar Rapids	0	------	------	0	------	4	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	448	------	0	------	9	0	------	0	0	47
Sioux City	0	554	------	0	------	17	2	------	0	0	------
Waterloo	1	------	------	1	------	3	0	------	0	16	------
Missouri:											
Kansas City	2	26	5	0	23	33	0	3	0	3	128
St. Joseph	2	------	0	1	4	3	34	0	0	1	30
St. Louis	8	23	15	3	47	32	2	14	0	31	334
North Dakota:											
Fargo	0	------	2	0	5	0	0	0	0	0	17
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	5
South Dakota:											
Aberdeen	0	------	------	0	------	5	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	4	2	28	16	0	0	0	0	100
Kansas:											
Lawrence	0	30	0	0	3	0	0	0	0	0	10
Topeka	0	------	2	0	4	5	0	0	0	0	20
Wichita	2	------	0	0	5	10	1	0	0	2	38
Delaware:											
Wilmington	3	------	0	87	5	1	0	0	0	0	36
Maryland:											
Baltimore	1	107	5	248	27	31	0	12	1	128	269
Cumberland	0	1	0	0	4	1	0	0	0	5	11
Frederick	0	------	0	0	1	1	0	0	0	0	3
District of Columbia:											
Washington	19	107	6	23	27	22	0	13	1	15	217
Virginia:											
Lynchburg	2	------	0	2	6	1	0	0	0	3	25
Norfolk	2	59	0	1	6	1	0	1	0	0	25
Richmond	1	------	3	0	12	6	0	0	0	1	62
Roanoke	0	------	0	4	4	3	0	0	0	0	21
West Virginia:											
Charleston	0	11	0	0	11	1	0	1	0	0	45
Wheeling	0	------	0	1	3	3	0	0	0	0	18
North Carolina:											
Gastonia	0	------	0	0	0	1	0	0	0	1	1
Raleigh	0	------	0	0	4	2	0	2	0	0	17
Wilmington	2	------	0	0	3	0	0	0	0	0	15
Winston-Salem	0	7	0	0	1	3	0	1	0	0	11
South Carolina:											
Charleston	3	63	0	0	9	7	0	1	0	0	29
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	0	0	2	0	0	1	0	0	15
Greenville	1	------	0	0	5	0	0	0	0	0	15
Georgia:											
Atlanta	0	38	4	0	19	0	0	2	0	0	96
Brunswick	0	------	0	0	0	0	0	0	0	3	8
Savannah	0	27	1	3	3	1	0	2	0	1	24
Florida:											
Miami	3	7	1	0	1	1	0	1	0	1	41
Tampa	2	------	0	0	2	2	0	2	0	1	35

City reports for week ended Jan. 16, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Kentucky:											
Ashland	0			0	2	0	0	1	0	0	13
Covington	0	23	1	0	10	1	0	0	0	0	
Lexington	0	5	0	5	6	0	0	1	0	0	21
Tennessee:											
Knoxville	2	363	1	0	5	1	0	2	0	0	29
Memphis	4		0	3	9	4	0	2	1	32	93
Nashville	0		3	1	8	1	0	1	0	0	57
Alabama:											
Birmingham	4	38	1	1	8	1	0	4	0	3	72
Mobile	3		1	0	1	2	0	1	0	0	27
Montgomery	0			0		2	0		1	0	
Arkansas:											
Fort Smith	0			0		1	0		0	0	
Little Rock	1	3	2	0	3	3	0	1	0	0	7
Louisiana:											
Lake Charles	0	5	0	0	0	0	0	0	0	0	2
New Orleans	5	12	0	1	22	0	0	16	1	0	164
Shreveport	1		0	1	7	0	0	1	1	1	34
Oklahoma:											
Muskogee	0			0		2	0		0	0	
Oklahoma City	0	14	0	8	10	3	0	2	0	1	49
Tulsa	2			1		4	0		0	0	
Texas:											
Dallas	3	16	4	1	10	9	0	2	1	9	77
Fort Worth	5		0	58	11	4	0	0	0	0	50
Galveston	0		0	2	1	0	0	2	0	0	14
Houston	8		1	0	12	3	0	4	0	3	88
San Antonio	1		6	1	11	3	0	7	1	0	79
Montana:											
Billings	0	9	1	0	7	0	0	0	0	2	16
Great Falls	0		2	0	1	1	0	0	0	0	10
Helena	0		0	0	0	5	0	0	0	0	3
Missoula	0	458	0	0	1	0	0	0	0	0	7
Idaho:											
Boise	0		0	0	2	2	0	1	0	0	14
Colorado:											
Colorado Springs	0		1	2	5	8	0	1	0	1	18
Denver	1		49	4	33	12	0	4	0	43	200
Pueblo	0	5	0	0	8	2	0	0	0	1	
New Mexico:											
Albuquerque	0	14	0	0	6	3	0	4	0	2	19
Utah:											
Salt Lake City	0		2	11	0	15	0	0	0	6	43
Nevada:											
Reno											
Washington:											
Seattle	0		4	12	10	1	0	6	0	6	129
Spokane											
Tacoma	0		0	0	5	2	0	0	0	1	30
Oregon:											
Portland	0	100	2	1	12	13	0	3	0	10	101
Salem	0	24		0		1	0		0	3	
California:											
Los Angeles											
Sacramento	0	5	0	2	11	21	0	1	0	1	44
San Francisco	3	316	7	4	23	20	0	9	0	24	248

City reports for week ended Jan. 16, 1937—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New Hampshire:				District of Columbia:			
Manchester	0	1	0	Washington	2	1	0
Massachusetts:				West Virginia:			
Boston	2	1	0	Wheeling	0	0	1
Worcester	1	1	0	South Carolina:			
New York:				Greenville	1	0	0
New York	17	3	0	Florida:			
New Jersey:				Miami	1	1	0
Newark	0	2	0	Kentucky:			
Pennsylvania:				Ashland	0	1	0
Philadelphia	2	3	0	Alabama:			
Pittsburgh	2	0	0	Birmingham	4	0	0
Ohio:				Arkansas:			
Cincinnati	0	1	0	Little Rock	1	1	0
Columbus	1	0	0	Louisiana:			
Toledo	1	0	0	New Orleans	0	1	1
Indiana:				Shreveport	0	2	0
Indianapolis	2	0	0	Oklahoma:			
Illinois:				Tulsa	0	0	1
Chicago	8	1	0	Texas:			
Springfield	0	1	0	Houston	2	0	0
Michigan:				Colorado:			
Detroit	1	0	0	Denver	1	0	0
Grand Rapids	0	0	1	Utah:			
Minnesota:				Salt Lake City	1	0	0
Minneapolis	1	1	1	California:			
Missouri:				Sacramento	1	1	0
St. Louis	2	0	0				
Maryland:							
Baltimore	5	3	0				

Encephalitis, epidemic or lethargic.—Cases: New York, 4; Philadelphia, 1; St. Paul, 1; Omaha, 1.
Pellagra.—Cases: Atlanta, 1; Savannah, 1; Miami, 2; San Francisco, 1.
Typhus fever.—Cases: Atlanta, 2; Savannah, 1.

FOREIGN AND INSULAR

AUSTRIA

Vital statistics—1933 and 1934—Comparative.—Following are vital statistics for Austria for the years 1933 and 1934, comparative.

	1933	1934		1933	1934
Population	6,536,892	6,760,233	Deaths from—Continued.		
Number of marriages	43,914	43,424	Homicide	198	329
Number of births	98,867	93,602	Inflammation of lungs	7,383	6,191
Deaths under 1 year of age	9,029	8,314	Malignant tumors	11,251	11,810
Total deaths	89,092	85,431	Measles	89	36
Deaths from:			Puerperal fever	244	229
Accidents	2,289	2,725	Scarlet fever	124	78
Apoplexy	5,838	5,544	Suicide	2,856	2,651
Cholera, infantile	576	534	Tuberculosis	8,087	7,506
Congenital debility	2,772	2,690	Typhoid fever	121	105
Diphtheria	980	1,006	Whooping cough	147	132
Dysentery	20	20			

CANADA

Provinces—Communicable diseases—2 weeks ended January 9, 1937.—During the 2 weeks ended January 9, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			2		5				5	12
Chicken pox		1	7	287	862	80	139	49	219	1,644
Diphtheria		7	1	44	29	6	8	1	3	99
Dysentery				2	5					7
Erysipelas				15	6	3	3	4	12	43
Influenza	1	12			91	6			41	151
Measles		17	10	572	735	26	1,114	491	1,722	4,687
Mumps			39		465	107	38	26	129	804
Paratyphoid fever				14	2					16
Pneumonia	12	4			68		1		19	104
Poliomyelitis				1	1	6	13			21
Scarlet fever		25	11	130	272	88	36	162	51	775
Trachoma						1			1	2
Tuberculosis	3	12	18	95	83	12	2	3	29	257
Typhoid fever					2	6	4	2	1	15
Undulant fever				6	2					8
Whooping cough		22		174	236	4	38	10	29	513

CUBA

Provinces—Notifiable diseases—4 weeks ended January 9, 1937.—During the 4 weeks ended January 9, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1			6		3	10
Diphtheria	2	4		1	4		11
Malaria	166	48	11	57	254	517	1,053
Measles	1		1			3	4
Poliomyelitis		1	1				2
Tuberculosis	8	12	33	19	20	22	114
Typhoid fever	11	26	2	60	6	26	131
Yaws						8	8

CZECHOSLOVAKIA

Communicable diseases—November 1936.—During the month of November 1936, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	7	1	Paratyphoid fever	49	1
Cerebrospinal meningitis	6	4	Poliomyelitis	20	1
Chicken pox	503		Puerperal fever	32	15
Diphtheria	3,104	174	Scarlet fever	2,928	43
Dysentery	13	2	Trachoma	85	
Influenza	75	2	Typhoid fever	666	58
Lethargic encephalitis	1		Typhus fever	10	
Malaria	35				

ITALY

Communicable diseases—4 weeks ended November 8, 1936.—During the 4 weeks ended November 8, 1936, cases of certain communicable diseases were reported in Italy as follows:

Disease	Oct. 12-18		Oct. 19-25		Oct. 26-Nov. 1		Nov. 2-8	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	30	23	23	20	28	20	17	17
Cerebrospinal meningitis	10	9	12	12	9	9	15	12
Chicken pox	79	51	173	82	164	87	257	122
Diphtheria and croup	633	304	750	335	642	318	638	333
Dysentery	23	17	10	9	11	7	19	14
Hookworm disease	20	8	16	8	8	7	3	2
Lethargic encephalitis	1	1	1	1	2	2		
Measles	369	93	557	124	692	137	918	155
Mumps	90	49	104	49	156	55	212	70
Paratyphoid fever	129	73	102	63	91	68	57	48
Poliomyelitis	39	32	25	22	45	40	38	34
Puerperal fever	41	38	46	46	33	30	44	41
Rabies			1	1				
Scarlet fever	350	170	380	179	333	149	402	176
Typhoid fever	700	392	717	378	568	312	491	263
Undulant fever	19	17	47	32	30	28	16	16
Whooping cough	245	100	240	79	238	74	243	72

NEWFOUNDLAND AND LABRADOR

Vital statistics—1935.—The following table shows the births and deaths, together with deaths from certain diseases, reported in Newfoundland and Labrador during 1935.

Population	296, 994
Births	6, 800
Birth rate per 1,000 population	22. 89
Deaths	4, 057
Death rate per 1,000 population	13. 66
Infant mortality rate	103. 8
Deaths from—	
Cancer	235
Heart disease	197
Pneumonia	272
Tuberculosis, all forms	580

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for January 29, 1937, pages 143–155. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued February 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Siam.—Information received from the American Consul in Bangkok, Siam, under date of December 31, 1936, states that the cholera epidemic in Siam appeared on the northwestern frontier during the first week in December, and was thought to have been introduced from Burma. The outbreak was stated to be increasing in both incidence of cases and deaths and in area of prevalence. Physicians have been sent to the severely infected areas, and efforts are being made to bring the epidemic under control by the establishment of quarantine stations, inoculation, and education in preventive measures by means of handbills and posters. More than 10,000 persons had been inoculated. It was feared that, with the approach of the warm season, the epidemic may increase in the rural districts.

Smallpox

Mexico.—During the month of October 1936, smallpox was reported in Mexico as follows: Mexico, D. F., 6 cases, 1 death; Nogales, Sonora State, 1 case; Toluca, Mexico State, 1 case.

Typhus fever

Mexico.—During the month of October 1936, typhus fever was reported in Mexico as follows: Aguascalientes, Aguascalientes State, 2 cases; Mexico, D. F., 14 cases, 7 deaths; Oaxaca, Oaxaca State, 2 cases, 1 death; Puebla, Puebla State, 2 cases; Queretaro, Queretaro State, 3 cases; San Luis Potosi, San Luis Potosi State, 1 case; Toluca, Mexico State, 18 cases, 1 death.

Peru.—During the month of October 1936, cases of typhus fever were reported in Peru, by Departments, as follows: Apurimac, 1; Arequipa, 3; Ayacucho, 1; Cuzco, 23; Huancavelica, 1; Huanuco, 12; Ica, 8; Junin, 12; Libertad, 6; Lima, 1; Puno, 12.

Yellow fever

Brazil—Matto Grosso State—Entre Rios.—On December 12, 1936, one case of yellow fever with one death was reported in Entre Rios, Matto Grosso State, Brazil.

Gold Coast—Accra.—During the week ended January 23, 1937, four fatal cases of yellow fever were reported at Accra, Gold Coast.

X

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

VOL. 52 FEBRUARY 12, 1937 NO. 7

PREVALENCE OF INFLUENZA IN THE UNITED STATES

In all sections of the country the number of cases of influenza reported in January has exceeded the seasonal expectancy. In the Middle Atlantic and East South Central areas the number of cases reported declined during the last 2 weeks of the month; that is, since January 17. The New England, East North Central, West North Central, and South Atlantic sections showed a decrease in the number of reported cases for the fourth week, January 24 to January 30. The West South Central, Mountain, and Pacific sections, however, have reported an increasing number of cases throughout January. The largest increase in cases, since January 17, was reported in the Pacific section.

Mortality from all causes in 86 large cities (table 1) likewise has shown an excess in all sections during January. In the East Central and Atlantic Coast States there has been only a slight excess in mortality from all causes, the peak of which was reached by the week ended January 9. Mortality is still high, however, in the New England and South Atlantic States. Death rates for the West North Central section show a decided excess over seasonal expectancy, particularly for the weeks ended January 16 and January 23. The West South Central section has had high rates of mortality throughout January, with no definite peak week. In the Mountain section the death rate from all causes was 29.1 per 1,000 for the week ended January 9, but declined to 22.7 for the week ended January 30. In the Pacific section the death rate has increased throughout January to 21.6 per 1,000 for the week ended January 30.

The small outbreak of influenza which started in the West South Central section in December and spread eastward across the Northern States and westward to the Pacific coast has been mild in the East and somewhat more severe in the West North Central, Mountain, and Pacific sections. Both reported cases and mortality from all causes indicate that during the latter part of January the epidemic declined in all sections of the country except the Pacific coast area.

The latest preliminary reports show 32,078 cases for the week ended February 6, as compared with 36,742 cases for the week ended January 30 and 35,953 for the week of January 23. The largest

increases for the week ended February 6 are shown for the following named widely separated States: Maine, West Virginia, and Texas. Most of the other States recorded decreases, with a few showing only slight increases. These figures are exclusive of Kentucky, and of Kentucky and Louisiana for the week of January 6.

TABLE 1.—*Mortality from all causes in 86 large cities*[1] *of 9 geographic areas of the United States, Dec. 13, 1936, to Jan. 30, 1937*

Week ended—	All cities: Current week	All cities: Corresponding week of 1933–34	New England (14 cities)	Middle Atlantic (16 cities)	East North Central (18 cities)	West North Central (8 cities)	South Atlantic (7 cities)	East South Central (5 cities)	West South Central (7 cities)	Mountain (2 cities)	Pacific (9 cities)
	DEATH RATE PER 1,000 PERSONS										
Dec. 19	12.9	11.9	14.4	12.2	11.9	12.7	16.4	14.0	14.0	15.5	13.2
Dec. 26	11.9	12.1	13.5	10.9	11.7	12.4	14.2	11.9	12.2	13.0	12.6
Jan. 2	14.4	12.2	15.2	13.5	14.2	14.1	18.6	18.3	15.3	19.1	13.6
Jan. 9	15.8	13.0	15.8	15.3	14.7	17.7	18.7	17.2	14.4	29.1	16.2
Jan. 16	15.4	12.8	15.5	15.1	13.2	19.0	18.7	15.4	15.2	28.4	16.8
Jan. 23	14.8	12.3	15.4	14.4	11.5	18.7	16.5	15.0	15.1	27.5	19.0
Jan. 30	14.9	12.2	15.4	14.0	11.9	16.7	17.5	14.3	16.4	22.7	21.6

[1] Cities of over 100,000 population in 1930.

INFLUENZA IN EUROPE

The following reports, though fragmentary, give some information regarding the prevalence of influenza in Europe. They are taken from the Weekly Epidemiological Record for January 21, 1937, issued by the Health Section of the League of Nations.

England and Wales.—For the 3 weeks ended January 9, 464 deaths from influenza were reported in London. The duration of the illness has been from 4 to 10 days, with fever and respiratory and gastrointestinal symptoms, the latter being of severe type in some instances.

Austria.—No abnormal prevalence was reported up to January 13.

Germany.—During the week ended January 2, the number of deaths from influenza recorded in 57 towns of more than 100,000 population decreased from 512 to 433, but the number of deaths from pneumonia increased from 581 to 637 and the general mortality rate from 14.2 to 14.7 per 1,000 population.

Denmark.—On January 11 the mild epidemic was reported to be diminishing rapidly. During December, 102,788 cases were reported, with a morbidity rate of 38.6 per 100,000 in Copenhagen, 36.0 in other towns, and 20.6 in the rural districts. For the week ended January 2, 1937, the number of cases in Copenhagen decreased from 3,618 (for the preceding week) to 2,674, while the number of deaths from influenza increased to 27 (as compared with 25 for the preceding

week), and the general mortality rate decreased from 18.9 to 15.6 per 1,000.

Scotland.—For the week ended January 9 the number of primary and acute pneumonia cases increased from 249 to 404, and that of acute influenzal pneumonia from 68 to 211. During the week ended January 16 the number of deaths from influenza in 16 towns increased from 185 to 220, in Glasgow from 33 to 131, and in Edinburgh from 12 to 36. The number of deaths from all respiratory disease increased in the 16 towns from 186 to 233, and the general death rate from 20.2 to 23.8.

Finland.—In the second half of December 1,336 cases of influenza were recorded, of which number 217 occurred at Helsingfors.

Hungary.—From January 10 to 16, 32 cases of influenza with complications were reported in Hungary, 6 of which were in Budapest.

Irish Free State.—January 3–9, deaths from influenza in 13 towns, 10; deaths from pneumonia, 23. The general mortality rate for the 13 towns was 15.5 per 1,000; for Dublin, 15.2.

Northern Ireland.—During the week ended January 16, the number of influenza deaths in Belfast rose from 17 to 46, the number of deaths from pneumonia from 20 to 35, and the number of deaths due to other respiratory diseases from 28 to 40. The death rate for the week was 34.8 per 1,000 as compared with 22.1 for the preceding week.

Norway.—For the weeks ended December 26, 1936, January 2, and January 9, 1937, the numbers of cases of influenza reported at Oslo were 134, 126, and 271, and the general mortality rate was 8.3, 15.6, and 15.4 per 1,000, respectively.

Netherlands.—For the week ended January 9, as compared with the preceding week, the number of deaths from influenza increased from 41 to 58, and the general death rate from 16.8 to 19.1 per 1,000.

Poland.—Notification of influenza is not compulsory in Poland, but the disease is reported to have prevailed in mild epidemic form in December 1936, and according to information dated January 20, 1937, a severe type was prevailing in Warsaw, with pulmonary complications being frequent and occasionally fatal.

Sweden.—Between December 20, 1936, and January 9, 1937, the weekly numbers of cases reported in Stockholm were 7, 16, and 35, and the general mortality rate was 8.7, 11.3, and 15.9 per 1,000.

Switzerland.—Only sporadic cases of influenza had been reported, but notification of influenza is not generally compulsory except in case of obvious epidemic.

STUDIES IN CHEMOTHERAPY

III. THE EFFECT OF p-AMINOBENZENE SULPHONAMIDE ON PNEUMOCOCCI IN VITRO

By SANFORD M. ROSENTHAL, *Senior Pharmacologist, National Institute of Health, United States Public Health Service*

It has previously been shown that p–aminobenzene sulphonamide possesses curative action in experimental pneumococcus infections in mice (*1*). This compound, along with Prontosil and Prontosil soluble, has been found effective experimentally and clinically against infections with hemolytic streptococci. A recent review of the literature is given by Domagk (*2*), to whom the original discovery of Prontosil is due. In our experiments the action of sulphonamide on pneumococci *in vivo* was not to any appreciable extent shared by Prontosil or Prontosil soluble.[1]

A study of the action of sulphonamide[2] on organisms *in vitro* has shown that this compound possesses marked bactericidal and bacteriostatic power against pneumococci,[3] while no such effects were present on hemolytic streptococci, *Staphylococcus albus*, and *E. coli*.

METHOD

Dilutions of sulphonamide base were made in plain broth of pH 7.3. The drug is soluble to 0.8 percent, and glass electrode determinations showed that the pH was unchanged after 24 hours' incubation. The tubes were inoculated with 2 drops of an 18-hour broth culture of the organisms. After 24 hours' incubation, transfers of 2 drops were made into broth tubes containing similar concentrations of sulphonamide; transfers were also made into broth without the drug, to test for viable organisms. This was continued for 5 or 6 days, and all cultures were observed 1 week for the presence of growth.

In the case of streptococci, 2 percent (neopeptone) broth was employed, in which medium these organisms grew abundantly.

RESULTS

Six highly virulent strains of pneumococci were employed—Mulford, types I, II, and III; Lederle, type I, an Institute strain (NIH), type I, and a type III strain recently isolated from pneumonia in man and sent us by Dr. J. C. Bullowa. Inhibition of growth and death of the organisms in 24 to 48 hours occurred in all strains with the presence of the drug in dilutions of 1 to 1,000 and 1 to 10,000.

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[1] Prontosil is 4-sulphonamide 2-4-diaminobenzol; Prontosil soluble is 4-sulphonamide-phenyl-2-azo-7-acetylamino-1-hydroxynaphthalene 3, 6 sodium disulphonate.

[2] In this paper sulphonamide refers to p-aminobenzene sulphonamide. It is now available commercially under the name "Prontylin" (Winthrop Chemical Co.).

[3] Dr. Sara E. Branham, of this Institute, has shown that a similar action is present on meningococci.

Inhibition of growth occurred in five of the six strains with dilutions of 1 to 100,000, while with 4 of them sterilization of cultures was obtained on the first to third day at this dilution. Four strains were tested at dilutions of 1 to 500,000. In one case sterilization of cultures was obtained on the second day, in one there was inhibition of growth only, while with the other two cases no visible effect was produced (table 1).

TABLE 1.—*The bacteriostatic and bactericidal action of p-aminobenzene sulphonamide against 6 strains of pneumococci. (This action is destroyed by acetylation of the compound)*

Strain of pneumococci and day	Dilution of drug: 1: 1,000	Subculture	1: 10,000	Subculture	1: 100,000	Subculture	1: 500,000	Subculture	1: 1,000,000	Controls	Acetylated sulphonamide 1: 1,000
Bullowa III:											
1st day	0	0	0	0	0	0	[1]0	[1]0	——	+++	——
2d day	0	0	0	0	0	0	[1]0	[1]0	——	+++	——
3d day	0	0	0	0	0	0	[1]0	[1]0	——	+++	——
4th day	0	0	0	0	0	0	[1]0	[1]0	——	+++	——
5th day	0	0	0	0	0	0	[1]0	[1]0	——	+++	——
Mulford II:											
1st day	++	++	++	++	[1]±	0	++	++	——	+++	——
2d day	0	0	0	0	0	0	[1]0	0	——	+++	——
3d day	0	0	0	0	0	0	0	0	——	+++	——
4th day	0	0	0	0	0	0	0	0	——	+++	——
5th day	0	0	0	0	0	0	0	0	——	+++	——
Mulford III:											
1st day	±	[1]0	+	[1]0	+++	+++	+++	+++	——	+++	+++
2d day	0	0	0	[1]0	[1]0	++	+++	+++	——	+++	+++
3d day	0	0	0	0	[1]0	[1]0	+	+++	——	+++	+++
4th day	0	0	0	0	[1]0	[1]0	+++	+++	——	+++	+++
5th day	0	0	0	0	+	+	+++	+++	——	+++	+++
Lederle I:											
1st day	0	[1]0	0	[1]0	+	+++	+++	——	——	+++	+++
2d day	0	0	0	0	++	+++	+++	——	——	+++	+++
3d day	0	0	0	0	+++	+++	+++	——	——	+++	+++
4th day	0	0	0	0	+++	+++	+++	——	——	+++	+++
5th day	0	0	0	0	+++	+++	+++	——	——	+++	+++
Mulford I:											
1st day	——	——	±	+	+++	+++	——	——	+++	+++	——
2d day	——	——	[1]0	[1]0	[1]0	[1]0	——	——	+++	+++	——
3d day	——	——	0	0	0	0	——	——	+++	+++	——
4th day	——	——	0	0	0	0	——	——	+++	+++	——
5th day	——	——	0	0	0	0	——	——	+++	+++	——
NIH I:											
1st day	——	——	0	[1]0	±	[1]0	——	——	+++	+++	——
2d day	——	——	0	0	0	0	——	——	+++	+++	——
3d day	——	——	0	0	0	0	——	——	+++	+++	——
4th day	——	——	0	0	0	0	——	——	+++	+++	——
5th day	——	——	0	0	0	0	——	——	+++	+++	——

[1] =++ after 48 to 96 hours' incubation.

In a previous report (*1*) on the curative effect of p–aminobenzene sulphonamide on pneumococcus infections in mice it was shown that acetylation of this compound destroyed its chemotherapeutic action. Likewise in the test tube the acetyl compound in dilutions of 1 to 1,000 did not influence the growth of two strains of pneumococci upon which tests were made (table 1). Also inactive in the body (*1*) and in the

test tube was Prontosil soluble, a diazotized sulphonamide. Pneumococcus strains Mulford I and II showed no inhibition of growth after 5 daily transfers in broth containing 1 to 500 dilution of Prontosil soluble.

EFFECT UPON OTHER ORGANISMS

Sulphonamide in dilutions of 1 to 1,000 had no bactericidal or bacteriostatic effect upon four strains of virulent hemolytic streptococci grown in 2 percent neopeptone broth[4] (table 2). The only effect observed was that after 3 or 4 days' growth (with daily transfer) in the presence of the drug the organisms grew in long chains and flocculated at the bottom of the test tube. After 5 days in the presence of the drug, tests upon mice showed no appreciable loss of virulence. Blood agar plate cultures were examined by Dr. Alice C. Evans, who found no difference from the controls in the appearance of the colonies. Also, when transferred after the fifth day to broth without the drug, the organisms grew without flocculation.

TABLE 2.—*The lack of inhibition of growth of p–aminobenzene sulphonamide on 4 strains of hemolytic streptococci*

Streptococcus and dilution	First day	Second day	Third day	Fourth day	Fifth day
Strep. 1779					
Control	+++	+++	+++	+++	+++
1:1000 sulphonamide	+++	+++	+++	[1] +++	[1] +++
Strep. 883					
Control	+++	+++	+++	+++	+++
1:1000 sulphonamide	+++	+++	[1] +++	[1] +++	[1] +++
Strep. 778					
Control	+++	+++	+++	+++	+++
1:100 sulphonamide	+++	+++	[1] +++	[1] +++	[1] +++
Strep. 1685					
Control	+++	+++	+++	+++	+++
1:2000 sulphonamide	+++	+++	++	[2] ±	[2] +

[1] Organisms flocculated at bottom of tube.
[2] Subculture +++.

Cultures of *Staphylococcus albus* and *E. coli* were grown in plain broth in the presence of sulphonamide (1 to 1,000) with daily transfers for 1 week; no difference from the control cultures was observed (table 3).

[4] Since this was written, papers have appeared by Long and Bliss (J. Am. Med. Assoc., 108:32 (1937)) and by Colebrook, Buttle, and O'Meara (Lancet, 2: 1323 (1936)) showing that inhibitory effects on the growth of streptococci can be demonstrated for sulphonamide if a small number of streptococci are inoculated into the culture medium. No effect was obtained with an inoculum similar to ours.

TABLE 3.—*The absence of effect of p–aminobenzene sulphonamide upon growth of Staphylococcus albus and E. coli*

Organism and dilution	First day	Second day	Third day	Fourth day	Fifth day
E. coli					
Control	+++	+++	+++	+++	+++
1–1,000 sulphonamide	+++	+++	+++	+++	+++
Staph. albus					
Control	+++	+++	+++	+++	+++
1–1,000 sulphonamide	+++	+++	+++	+++	+++

DISCUSSION

The bacteriostatic and bactericidal action of sulphonamide on pneumococci *in vitro* is adequate to explain its chemotherapeutic effect in animals.[5] The nature of this action *in vitro* is unusual in that the drug is not an antiseptic in the usual sense. The specificity of its action upon certain organisms, as well as its low toxicity for animals, differentiates it from the class of antiseptics that are general protoplasmic poisons.

These results are interesting from the point of view of action upon streptococci. Thus the drug is more effective against streptococci than pneumococci in animals but not inhibitory to growth of streptococci in the test tube.[5] Levaditi and Vaisman (*3*) have shown a neutralizing effect from Prontosil upon the leucocidins and hemolysins of streptococci *in vitro*, but the mode of action has been inadequately explained (*2*). Domagk suggests among other possibilities that these compounds may be converted into active agents in the body, and the demonstration that sulphonamide itself can be active *in vitro* against some organisms lends support to such a belief. The fact that in our experiments diazotization and acetylation of the sulphonamide compound destroy its activity both in the body and in the test tube is evidence that the mode of action is the same in both cases. Fourneau, Trefouel, Nitti, and Bovet (*4*) have shown a retardation of growth of molds by certain sulphonamide compounds, and this action was found to be related to the antistreptococcic activity of these compounds in animals.

CONCLUSIONS

p–aminobenzene sulphonamide has been found to be bactericidal and bacteriostatic to pneumococci in high dilutions *in vitro*.

The lack of effect upon the growth of streptococci, *Staphylococcus albus*, and *E. coli*, previously shown by other workers for Prontosil, was likewise established for p–aminobenzene sulphonamide.

[5] The dose required in animals is 1 gm per kilo or greater so that concentrations can be reached in the body within the range effective in the test tube.

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(3) Levaditi, C., and Vaisman, A.: Compt. Rend. Soc. Biol., 120: 1077 (1935).
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DEATH RATES AND BIRTH RATES, BY STATES, 1934 AND 1935 AND SUMMARY FOR THE REGISTRATION AREAS, 1920–35

According to figures compiled by the Bureau of the Census, Department of Commerce, there were 1,392,752 deaths in the United States in 1935, as compared with 1,396,903 in 1934, giving death rates of 10.9 and 11.0 per 1,000 estimated population for these years, respectively. The accompanying tables and statements were recently issued by the Bureau of the Census.

It is stated that the high death rates shown for Arizona, New Mexico, and Nevada are due in large measure to an excess in the number of nonresident deaths from tuberculosis, while those in the New England area are due largely to the relatively greater advanced age of the population. The variations in the birth rates for the different States or geographical areas are due to a combination of biological and social factors, such as race, age of population, and fertility.

The second table presents a summary of the data for births and deaths for the birth and death registration areas for each year since and including 1920. Prior to 1933 the registration areas did not include the same States. Beginning with 1933, however, both areas have included all of the States.

Both birth and death rates have declined in the last 15 years, but the infant mortality rate has also been lowered, and to a greater degree, decreasing almost one-third during this period.

Summary of natality and mortality data for each State, 1935 and 1934

Area	Estimated population July 1		Total births		Total deaths		Rate per 1,000 estimated population			
							Births		Deaths	
	1935	1934	1935	1934	1935	1934	1935	1934	1935	1934
United States	127,521,000	126,626,000	2,155,105	2,167,636	1,392,752	1,396,903	16.9	17.1	10.9	11.0
Alabama	2,834,000	2,805,000	62,239	63,495	28,585	29,361	22.0	22.6	10.1	10.5
Arizona	406,000	406,000	9,139	8,492	6,077	5,647	22.5	20.9	15.0	13.9
Arkansas	1,999,000	1,976,000	35,684	37,515	16,176	16,888	17.9	19.0	8.1	8.5
California	5,997,000	5,937,000	80,131	78,346	72,456	68,095	13.4	13.2	12.1	11.5
Colorado	1,062,000	1,058,000	18,837	17,849	13,134	12,497	17.7	16.9	12.4	11.8
Connecticut	1,717,000	1,700,000	22,258	22,215	17,659	17,438	13.0	13.1	10.3	10.3
Delaware	256,000	253,000	4,036	3,988	3,208	3,354	15.8	15.8	12.5	13.[illegible]
District of Columbia	594,000	560,000	10,863	10,137	8,483	8,274	18.2	18.1	14.3	14.8
Florida	1,614,000	1,587,000	28,051	26,716	20,046	20,357	17.4	16.8	12.4	12.[illegible]

Summary of natality and mortality data for each State, 1935 and 1934—Continued

Area	Estimated population July 1		Total births		Total deaths		Rate per 1,000 estimated population			
							Births		Deaths	
	1935	1934	1935	1934	1935	1934	1935	1934	1935	1934
Georgia	3, 035, 000	3, 011, 000	63, 260	64, 661	34, 288	35, 580	20. 8	21. 5	11. 3	11. 8
Idaho	479, 000	473, 000	9, 469	9, 373	4, 531	4, 377	19. 8	19. 8	9. 5	9. 3
Illinois	7, 817, 000	7, 790, 000	111, 884	110, 226	85, 518	87, 205	14. 3	14. 1	10. 9	11. 2
Indiana	3, 429, 000	3, 400, 000	52, 909	52, 349	39, 515	40, 650	15. 4	15. 4	11. 5	12. 0
Iowa	2, 534, 000	2, 525, 000	41, 137	42, 463	26, 364	26, 758	16. 2	16. 8	10. 4	10. 6
Kansas	1, 878, 000	1, 870, 000	30, 589	32, 463	20, 334	19, 951	16. 3	17. 4	10. 8	10. 7
Kentucky	2, 846, 000	2, 810, 000	57, 715	59, 904	29, 370	30, 148	20. 3	21. 3	10. 3	10. 7
Louisiana	2, 120, 000	2, 118, 000	42, 270	43, 003	23, 711	23, 254	19. 9	20. 3	11. 2	11. 0
Maine	845, 000	837, 000	15, 723	15, 760	11, 024	10, 937	18. 6	18. 8	13. 0	13. 1
Maryland	1, 669, 000	1, 664, 000	27, 236	27, 340	21, 182	20, 946	16. 3	16. 4	12. 7	12. 6
Massachusetts	4, 375, 000	4, 326, 000	63, 001	63, 828	50, 237	50, 580	14. 4	14. 8	11. 5	11. 7
Michigan	4, 731, 000	4, 680, 000	87, 446	83, 925	51, 050	50, 442	18. 5	17. 9	10. 8	10. 8
Minnesota	2, 627, 000	2, 619, 000	45, 962	45, 921	26, 247	26, 570	17. 5	17. 5	10. 0	10. 1
Mississippi	2, 008, 000	2, 008, 000	48, 320	47, 863	21, 339	21, 832	24. 1	23. 8	10. 6	10. 9
Missouri	3, 913, 000	3, 868, 000	57, 299	59, 185	43, 201	46, 639	14. 6	15. 3	11. 0	12. 1
Montana	531, 000	531, 000	10, 029	9, 949	6, 291	5, 617	18. 9	18. 7	11. 8	10. 6
Nebraska	1, 364, 000	1, 364, 000	23, 327	25, 085	13, 181	13, 372	17. 1	18. 4	9. 7	9. 8
Nevada	99, 000	98, 000	1, 423	1, 434	1, 324	1, 297	14. 4	14. 6	13. 4	13. 2
New Hampshire	502, 000	496, 000	7, 768	7, 869	6, 532	6, 397	15. 5	15. 9	13. 0	12. 9
New Jersey	4, 288, 000	4, 249, 000	54, 514	54, 541	43, 284	43, 819	12. 7	12. 8	10. 1	10. 3
New Mexico	422, 000	422, 000	13, 190	12, 769	6, 272	6, 115	31. 3	30. 3	14. 9	14. 5
New York	12, 890, 000	12, 846, 000	184, 344	185, 615	148, 462	149, 088	14. 3	14. 4	11. 5	11. 6
North Carolina	3, 417, 000	3, 378, 000	78, 753	79, 704	33, 485	35, 180	23. 0	23. 6	9. 8	10. 4
North Dakota	700, 000	697, 000	13, 655	14, 549	5, 860	5, 844	19. 5	20. 9	8. 4	8. 4
Ohio	6, 707, 000	6, 701, 000	101, 103	100, 100	77, 356	77, 101	15. 1	14. 9	11. 5	11. 5
Oklahoma	2, 509, 000	2, 491, 000	43, 691	47, 302	21, 091	21, 373	17. 4	19. 0	8. 4	8. 6
Oregon	1, 008, 000	999, 000	13, 179	13, 077	11, 430	10, 540	13. 1	13. 1	11. 3	10. 6
Pennsylvania	10, 067, 000	10, 000, 000	161, 166	160, 238	108, 555	109, 601	16. 0	16. 0	10. 8	11. 0
Rhode Island	681, 000	681, 000	10, 215	10, 349	7, 838	7, 703	15. 0	15. 2	11. 5	11. 3
South Carolina	1, 840, 000	1, 821, 000	40, 598	44, 265	20, 353	21, 312	22. 1	24. 3	11. 1	11. 7
South Dakota	692, 000	692, 000	12, 850	13, 173	6, 316	6, 455	18. 6	19. 0	9. 1	9. 3
Tennessee	2, 824, 000	2, 785, 000	53, 314	52, 393	30, 002	30, 312	18. 9	18. 8	10. 6	10. 9
Texas	6, 077, 000	6, 038, 000	114, 721	116, 603	61, 663	59, 731	18. 9	19. 3	10. 1	9. 9
Utah	515, 000	514, 000	12, 695	12, 636	5, 066	4, 841	24. 7	24. 6	9. 8	9. 4
Vermont	377, 000	374, 000	6, 591	6, 593	4, 777	4, 878	17. 5	17. 6	12. 7	13. 0
Virginia	2, 637, 000	2, 604, 000	51, 487	52, 375	30, 358	30, 559	19. 5	20. 1	11. 5	11. 7
Washington	1, 633, 000	1, 623, 000	22, 396	22, 540	18, 203	17, 552	13. 7	13. 9	11. 1	10. 8
West Virginia	1, 816, 000	1, 802, 000	41, 774	41, 476	18, 340	17, 941	23. 0	23. 0	10. 1	10. 0
Wisconsin	2, 908, 000	2, 908, 000	52, 562	51, 419	30, 694	30, 399	18. 1	17. 7	10. 6	10. 5
Wyoming	232, 000	231, 000	4, 362	4, 565	2, 284	2, 096	18. 8	19. 8	9. 8	9. 1

Summary of natality and mortality data for the registration areas, 1920–1935

Year	Estimated population of United States	Birth registration area					
		Population		Births		Infant mortality	Births per 100 deaths
		Number	Percent of total in United States	Number	Per 1,000 population		
1935	127, 521, 000	127, 521, 000	100. 0	2, 155, 105	16. 9	55. 7	155
1934	126, 626, 000	126, 626, 000	100. 0	2, 167, 636	17. 1	60. 1	155
1933	125, 770, 000	125, 770, 000	100. 0	2, 081, 232	16. 6	58. 1	155
1932	124, 974, 000	119, 027, 000	95. 2	2, 074, 042	17. 4	57. 6	160
1931	124, 113, 000	117, 522, 000	94. 7	2, 112, 760	18. 0	61. 6	162
1930	123, 091, 000	116, 556, 000	94. 7	2, 203, 958	18. 9	64. 6	167
1929	121, 526, 429	115, 097, 972	94. 7	2, 169, 920	18. 9	67. 6	158
1928	119, 861, 607	113, 050, 663	94. 3	2, 233, 149	19. 8	68. 7	164
1927	118, 196, 785	103, 575, 656	87. 6	2, 137, 836	20. 6	64. 6	182
1926	116, 531, 963	89, 682, 479	77. 0	1, 856, 068	20. 7	73. 3	170
1925	114, 867, 141	87, 486, 096	76. 2	1, 878, 880	21. 5	71. 7	182
1924	113, 202, 319	86, 256, 025	76. 2	1, 930, 614	22. 4	70. 8	192
1923	111, 537, 497	80, 694, 406	72. 3	1, 792, 646	22. 2	77. 1	181
1922	109, 872, 675	79, 415, 841	72. 3	1, 774, 911	22. 3	76. 2	189
1921	108, 207, 853	70, 738, 177	65. 4	1, 714, 261	24. 2	75. 6	208
1920	106, 543, 031	63, 740, 689	59. 8	1, 508, 874	23. 7	85. 8	180

Summary of natality and mortality data for the registration areas, 1920–1935—Con.

Year	Death registration area			
	Population		Deaths	
	Number	Percent of total in United States	Number	Per 1,000 population
1935	127, 521, 000	100. 0	1, 392, 752	10. 9
1934	126, 626, 000	100. 0	1, 396, 903	11. 0
1933	125, 770, 000	100. 0	1, 342, 106	10. 7
1932	120, 291, 000	96. 3	1, 308, 529	10. 9
1931	119, 479, 000	96. 3	1, 322, 587	11. 1
1930	118, 472, 000	96. 2	1, 343, 356	11. 3
1929	116, 317, 515	95. 7	1, 386, 363	11. 9
1928	114, 258, 516	95. 3	1, 378, 675	12. 1
1927	108, 177, 568	91. 5	1, 236, 949	11. 4
1926	104, 938, 301	90. 1	1, 285, 927	12. 3
1925	102, 951, 999	89. 6	1, 219, 019	11. 8
1924	100, 032, 062	88. 4	1, 173, 990	11. 7
1923	97, 816, 104	87. 7	1, 193, 017	12. 2
1922	93, 866, 240	85. 4	1, 101, 863	11. 7
1921	89, 102, 434	82. 3	1, 032, 009	11. 6
1920	87, 632, 592	82. 3	1, 142, 558	13. 0

DEATHS DURING WEEK ENDED JANUARY 23, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 23, 1937	Corresponding week, 1936
Data from 85 large cities of the United States:		
Total deaths	10, 578	11, 036
Average for 3 prior years	9, 137	
Total deaths, first 3 weeks of year	32, 918	28, 290
Deaths under 1 year of age	626	635
Average for 3 prior years	591	
Deaths under 1 year of age, first 3 weeks of year	1, 977	1, 679
Data from industrial insurance companies:		
Policies in force	66, 544, 696	65, 483, 652
Number of death claims	16, 346	14, 583
Death claims per 1,000 policies in force, annual rate	12. 8	11. 6
Death claims per 1,000 policies, 3 weeks of year, annual rate	11. 9	11. 2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 30, 1937, and February 1, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 30, 1937, and Feb. 1, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936
New England States:								
Maine	3	4	374	1	50	303	0	0
New Hampshire			1		12	34	0	0
Vermont						204	0	0
Massachusetts	5	11			863	513	4	3
Rhode Island		2	9		124	100	1	1
Connecticut	1	3	984	3	347	71	0	3
Middle Atlantic States:								
New York	40	39	[1] 208	[1] 17	296	1,166	7	20
New Jersey	10	8	163	10	440	55	5	4
Pennsylvania	48	51			84	643	10	2
East North Central States:								
Ohio	21	31	731	122	65	150	12	15
Indiana	21	29	322	28	13	17	4	1
Illinois	32	70	226	23	23	35	7	13
Michigan	19	10	83	2	44	59	2	2
Wisconsin	2	2	1,227	51	19	124	0	1
West North Central States:								
Minnesota	5	3	14	1	34	151	1	4
Iowa	4	11	556	2		9	0	2
Missouri	20	17	2,000	181	4	24	4	7
North Dakota		4	225	4		1	2	0
South Dakota	2	3	216		2	31	0	0
Nebraksa		3	78		2	25	1	0
Kansas	9	11	3,640	29	6	18	1	1
South Atlantic States:								
Delaware	1	2			97	92	0	0
Maryland [2]	17	7	471	42	338	149	4	13
District of Columbia	7	19	130	4	32	6	2	4
Virginia	45	34			180	66	4	4
West Virginia	2	21	236	279	12	5	3	8
North Carolina [3]	33	24	34	36	54	17	3	3
South Carolina	9	17	827	572	44	10	1	3
Georgia [3]	13	13	600	259			3	3
Florida [3]	17	8	40	5	7		5	1
East South Central States;								
Kentucky [4]		22		62		60		13
Tennessee [5]	15	14	653	124		13	5	7
Alabama [3]	27	15	466	301	6	33	1	0
Mississippi [3]	8	5					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 30, 1937, and Feb. 1, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936
West South Central States:								
Arkansas	7	3	864	50	3	2	1	2
Louisiana	9	20	235	10	4	37	0	0
Oklahoma [4]	9	9	505	190	32	1	2	15
Texas [3]	50	60	2,435	299	324	70	0	11
Mountain States:								
Montana	1	2	3,343	26	4	39	0	1
Idaho	2	1	230	4	73	31	0	0
Wyoming			30		1	3	0	0
Colorado	7	11			3	7	1	1
New Mexico	4	9	930	3	26	7	0	3
Arizona	1		1,154	125	191	9	1	1
Utah [3]	2	2	7		154		0	0
Pacific States:								
Washington	13	5	415		69	193	2	0
Oregon		3	2,187	29	7	540	1	0
California	30	46	9,893	131	50	1,228	11	5
Total	571	684	36,742	3,025	4,139	6,351	111	178
First 4 weeks of year	2,488	2,985	108,110	11,140	16,688	21,943	542	716

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936
New England States:								
Maine	0	0	21	19	0	0	0	1
New Hampshire	0	0	5	9	0	0	0	0
Vermont	0	0	10	21	0	1	0	0
Massachusetts	0	1	249	228	0	0	0	3
Rhode Island	0	0	74	13	0	0	0	0
Connecticut	0	0	108	56	0	0	0	0
Middle Atlantic States:								
New York	0	1	788	740	3	0	5	5
New Jersey	1	2	172	244	0	0	3	2
Pennsylvania	1	0	650	490	0	0	7	6
East North Central States:								
Ohio	2	0	438	472	8	2	0	4
Indiana	0	1	193	229	2	3	0	2
Illinois	2	0	551	684	32	6	8	2
Michigan	1	0	666	310	0	0	3	1
Wisconsin	0	1	348	473	18	5	2	2
West North Central States:								
Minnesota	0	1	147	374	5	9	0	1
Iowa	0	1	191	186	24	10	1	4
Missouri	0	0	234	163	97	3	1	3
North Dakota	0	0	29	96	20	7	0	0
South Dakota	2	0	116	72	4	16	0	0
Nebraska	2	0	70	139	2	45	0	2
Kansas	0	1	291	269	11	11	1	2
South Atlantic States:								
Delaware	0	0	12	8	0	0	1	0
Maryland [3]	0	0	57	82	0	0	1	3
District of Columbia	0	0	16	16	0	0	0	1
Virginia	1	0	30	40	0	0	8	13
West Virginia	0	0	47	37	0	0	3	2
North Carolina [3]	0	1	47	32	2	1	9	2
South Carolina	0	1	6	5	0	0	2	0
Georgia [3]	1	0	16	24	0	0	3	2
Florida [3]	0	0	11	13	0	0	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 30, 1937, and Feb. 1, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936	Week ended Jan. 30, 1937	Week ended Feb. 1, 1936
East South Central States:								
Kentucky [4]	--------	1	--------	71	--------	0	--------	9
Tennessee [5]	1	0	26	44	0	0	9	6
Alabama [3]	0	1	14	14	2	0	2	2
Mississippi [2]	0	0	4	17	0	0	2	0
West South Central States:								
Arkansas	2	0	7	5	2	4	3	1
Louisiana	1	0	5	17	0	2	4	2
Oklahoma [6]	1	0	22	36	0	0	1	5
Texas [3]	4	0	108	115	2	1	9	8
Mountain States:								
Montana	0	0	35	120	7	9	0	1
Idaho	0	1	39	60	2	0	0	0
Wyoming	0	0	5	131	0	0	0	0
Colorado	0	0	28	213	0	1	0	0
New Mexico	1	0	18	62	0	1	0	1
Arizona	0	0	33	30	0	0	0	0
Utah [2]	0	0	23	72	5	0	0	0
Pacific States:								
Washington	0	1	80	127	10	12	1	3
Oregon	3	0	15	38	18	3	0	1
California	2	0	306	397	4	10	8	9
Total	28	15	6,361	7,113	275	162	98	111
First 4 weeks of year	100	73	23,617	29,330	1,144	863	487	446

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 30, 1937, 26 cases, as follows: North Carolina, 1; Georgia, 9; Florida, 1; Alabama, 5; Texas, 10.
[4] Report for week ended Jan. 30, 1937, not received.
[5] Report incomplete.
[6] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1936										
Puerto Rico	--------	57	53	1,997	196	4	1	1	0	205
December 1936										
Illinois	24	160	715	6	80	--------	13	1,729	2	26
Kansas	4	44	40	--------	32	--------	12	1,093	50	10
Montana	6	9	197	--------	12	1	2	251	105	5
North Dakota	--------	5	26	--------	1	--------	0	232	47	2
Oregon	6	2	145	--------	29	--------	2	130	108	6
South Dakota	1	--------	38	--------	4	--------	1	271	37	3
Tennessee	6	119	265	16	34	8	11	174	0	39
Texas	17	367	2,504	803	348	133	14	550	5	78
Virginia	18	121	1,098	5	138	2	1	176	0	27
Washington	2	25	41	--------	88	--------	2	241	16	7

Summary of monthly reports from States—Continued

October 1936

	Cases
Puerto Rico:	
Chickenpox	8
Dysentery	49
Filariasis	6
Mumps	5
Ophthalmia neonatorum	3
Puerperal septicemia	5
Tetanus	10
Tetanus, infantile	5
Trachoma	1
Whooping cough	30

December 1936

	Cases
Actinomycosis:	
Kansas	1
Anthrax:	
Washington	1
Chickenpox:	
Illinois	1,814
Kansas	478
Montana	238
North Dakota	163
Oregon	302
South Dakota	116
Tennessee	218
Texas	431
Virginia	265
Washington	962
Dengue:	
Texas	19
Dysentery:	
Illinois (amoebic)	3
Illinois (amoebic carriers)	10
Illinois (bacillary)	7
North Dakota (amoebic)	1
Tennessee (bacillary)	5
Texas (bacillary)	55
Virginia (amoebic)	1
Virginia (bacillary, diarrhea included)	35
Encephalitis, epidemic or lethargic:	
Illinois	6
Kansas	3

December 1936—Continued

	Cases
Encephalitis, epidemic or lethargic—Continued.	
Tennessee	1
Texas	3
Washington	7
German measles:	
Illinois	31
Kansas	3
North Dakota	1
Tennessee	6
Washington	14
Impetigo contagiosa:	
Kansas	6
Oregon	43
Tennessee	1
Washington	4
Jaundice:	
Kansas	1
Oregon	1
Lead poisoning:	
Illinois	1
Mumps:	
Illinois	387
Kansas	527
Montana	360
North Dakota	83
Oregon	56
South Dakota	3
Tennessee	50
Texas	616
Virginia	81
Washington	204
Ophthalmia neonatorum:	
Illinois	2
Tennessee	3
Virginia	2
Paratyphoid fever:	
Illinois	1
Texas	7
Puerperal septicemia:	
South Dakota	3
Rabies in animals:	
Illinois	22
Texas	4
Washington	18
Scabies:	
Kansas	1
Oregon	35
Tennessee	14

December 1936—Continued

	Cases
Septic sore throat:	
Illinois	11
Kansas	2
Montana	43
Oregon	8
South Dakota	1
Tennessee	5
Virginia	18
Tetanus:	
Illinois	6
Trachoma:	
Illinois	52
Oregon	2
South Dakota	20
Tennessee	10
Trichinosis:	
Illinois	1
Tularaemia:	
Illinois	49
Kansas	20
Tennessee	7
Texas	3
Virginia	14
Typhus fever:	
Tennessee	1
Texas	50
Undulant fever:	
Illinois	8
Kansas	12
North Dakota	1
Tennessee	2
Texas	10
Washington	1
Vincent's infection:	
Illinois	31
Kansas	5
North Dakota	3
Oregon	11
Tennessee	40
Whooping cough:	
Illinois	784
Kansas	85
Montana	33
North Dakota	3
Oregon	144
South Dakota	1
Tennessee	69
Texas	201
Virginia	179
Washington	72

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 23, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	3	1	1	2	4	0	0	0	11	31
New Hampshire:											
Concord	0		3	0	0	0	0	0	0	0	14
Manchester	0		1	2	3	1	0	0	0	0	17
Nashua	0			0	1	0	0		0	0	
Vermont:											
Barre											
Burlington	0		0	0	0	0	0	0	0	1	3
Rutland	0		0	1	2	0	0	0	0	0	8
Massachusetts:											
Boston	2		2	7	57	49	0	5	0	223	268
Fall River	0		1	2	5	4	0	1	0	4	40
Springfield	0		0	20	3	7	0	1	0	18	27
Worcester	0		0	119	18	4	0	1	0	34	
Rhode Island:											
Pawtucket	0		0	7	0	0	0	0	0	0	19
Providence	1	1	1	144	8	26	0	4	0	17	73
Connecticut:											
Bridgeport	0	68	2	72	2	5	0	3	0	1	33
Hartford	0	106	1	1	11	8	0	0	0	3	56
New Haven	0	92	3	1	1	4	0	0	0	1	54
New York:											
Buffalo	1	30	11	70	29	30	0	4	0	39	172
New York	34	432	58	53	326	259	0	102	2	59	1,936
Rochester	0	10	0	0	12	2	0	2	1	8	71
Syracuse	1		1	16	10	30	0	1	0	42	54
New Jersey:											
Camden	0	18	3	0	8	1	0	1	0	7	41
Newark	0	78	1	182	18	12	0	7	0	30	116
Trenton	1	13	1	1	4	3	0	1	0	2	32
Pennsylvania:											
Philadelphia	12	146	19	14	67	191	0	25	0	95	563
Pittsburgh	2	93	37	0	59	47	0	6	0	28	295
Reading	0		0	3	0	11	0	0	0	39	28
Scranton	0			0		21	0		0	0	
Ohio:											
Cincinnati											
Cleveland	0	274	11	6	33	73	0	9	0	75	225
Columbus	3	5	5	1	10	6	0	2	0	13	82
Toledo	1	9	5	2	14	8	0	5	0	37	105
Indiana:											
Anderson	0		0	1	1	4	0	0	0	0	11
Fort Wayne	1		3	0	8	3	0	0	0	0	33
Indianapolis	0		6	0	37	16	0	3	0	5	135
Muncie	0	41	0	0	4	11	0	1	0	0	18
South Bend	0		1	1	1	2	0	2	0	4	8
Terre Haute	1		0	0	0	2	0	0	0	0	18
Illinois:											
Alton	0	14	0	0	2	8	0	0	0	0	7
Chicago	5	66	13	13	43	193	0	41	3	79	694
Elgin	0		0	0	2	0	0	0	0	10	14
Moline	0	26	1	0	3	0	0	0	0	7	9
Springfield	0	1	0	0	4	2	0	0	0	12	31
Michigan:											
Detroit	16	57	12	5	59	345	0	28	1	82	318
Flint	2		0	4	4	14	0	0	0	1	35
Grand Rapids	0	18	1	6	1	8	0	1	0	19	40
Wisconsin:											
Kenosha	0	4	0	0	3	5	0	0	0	1	12
Madison	0		0	0	3	4	0	1	0	0	21
Milwaukee	0	7	0	1	16	46	0	4	0	28	122
Racine	0	2	2	1	2	9	0	0	0	2	14
Superior	0		1	0	0	4	0	0	0	14	7
Minnesota:											
Duluth	0		1	0	2	6	0	0	0	0	23
Minneapolis	0		8	7	22	24	0	2	0	16	147
St. Paul	0	4	4	4	21	10	0	2	0	32	95

City reports for week ended Jan. 23, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids	0	------	------	0	------	0	0	------	0	1	------
Davenport	1	------	------	0	1	5	0	------	0	0	------
Des Moines	0	223	------	0	------	18	0	------	0	0	53
Sioux City	1	------	------	0	------	11	0	------	0	0	------
Waterloo	1	------	------	0	------	5	0	------	0	10	------
Missouri:											
Kansas City	2	35	9	0	34	45	0	0	0	4	147
St. Joseph	0	42	0	0	10	2	47	0	0	0	32
St. Louis	7	41	19	0	59	36	1	16	0	55	357
North Dakota:											
Fargo	0	------	0	0	2	1	1	0	0	0	6
Grand Forks	0	------	------	0	------	0	1	------	0	0	------
Minot	0	------	0	0	0	0	4	0	0	0	6
South Dakota:											
Aberdeen	0	------	------	0	------	8	0	------	0	0	------
Sioux Falls	0	------	------	0	------	3	0	------	0	0	------
Nebraska:											
Omaha	0	------	2	0	29	11	0	3	0	5	96
Kansas:											
Lawrence	0	66	0	0	2	6	0	0	0	0	5
Topeka	0	188	0	------	6	6	0	0	0	0	20
Wichita	3	5	0	1	6	3	0	2	0	0	37
Delaware:											
Wilmington	0	------	0	137	10	1	0	1	0	4	35
Maryland:											
Baltimore	5	139	1	224	45	32	0	18	1	90	276
Cumberland	0	5	0	0	4	3	0	0	0	3	19
Frederick	0	------	0	1	0	0	0	0	0	0	4
District of Columbia:											
Washington	9	143	9	28	35	18	0	16	1	13	206
Virginia:											
Lynchburg	0	------	0	0	0	0	0	0	0	2	8
Richmond	0	------	3	0	6	5	0	0	0	0	45
Roanoke	2	------	0	17	2	3	0	1	0	0	15
West Virginia:											
Charleston	1	9	0	0	3	0	0	0	0	0	18
Wheeling	0	6	0	0	2	1	0	0	0	0	14
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	0	------	0	1	4	0	0	2	0	0	22
Wilmington	1	------	0	1	3	0	0	0	0	1	12
Winston-Salem	0	1	0	0	0	3	0	0	0	0	13
South Carolina:											
Charleston	1	225	2	0	0	0	0	0	0	0	21
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	------	0	1	0	0	------	0	0	9
Greenville	1	------	0	1	2	0	0	0	0	0	12
Georgia:											
Atlanta	3	209	3	0	12	23	0	1	0	0	71
Brunswick	0	1	1	0	0	0	0	0	0	0	7
Savannah	1	31	1	0	2	1	0	2	0	2	30
Florida:											
Miami	0	------	1	1	3	0	0	3	0	0	38
Tampa	4	4	1	0	1	1	0	1	0	0	25
Kentucky:											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Covington	0	34	------	1	6	5	0	1	0	0	54
Lexington	0	1	0	1	5	0	0	2	0	0	27
Louisville	------	------	------	------	------	------	------	------	------	------	------
Tennessee:											
Knoxville	0	323	7	1	4	1	0	0	0	0	24
Memphis	1	------	5	0	12	3	0	4	1	3	115
Nashville	1	------	3	0	9	4	0	2	0	0	48
Alabama:											
Birmingham	2	87	2	0	9	1	0	5	0	11	57
Mobile	2	2	2	1	1	0	0	1	0	0	20
Montgomery	0	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	1	0	------	0	0	------
Little Rock	0	21	0	2	7	0	0	0	0	0	7
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	0	0	1	3
New Orleans	------	------	------	------	------	------	------	------	------	------	------
Shreveport	1	------	0	0	13	0	0	2	0	0	63

City reports for week ended Jan. 23, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Oklahoma City	1	10	1	0	8	0	0	2	0	4	39
Tulsa	0	------	--------	1	0	3	0	-------	0	0	--------
Texas:											
Dallas	6	11	5	3	15	4	0	2	0	4	81
Fort Worth	0	------	3	66	13	3	0	0	0	0	61
Galveston	0	------	0	1	1	1	0	2	0	0	17
Houston	2	------	1	0	15	2	0	4	0	5	86
San Antonio	0	------	4	5	13	4	0	9	1	1	86
Montana:											
Billings	0	4	1	0	2	1	0	0	0	1	16
Great Falls	0	------	9	0	2	1	0	0	0	0	19
Helena	0	320	0	1	0	8	0	0	0	0	6
Missoula	0	321	0	0	5	0	0	0	0	2	12
Idaho:											
Boise	0	------	1	0	2	0	0	0	0	0	16
Colorado:											
Colorado Springs	1	------	1	0	9	5	0	1	0	0	21
Denver	1	------	0	3	37	11	0	8	0	38	92
Pueblo	0	------	3	0	2	7	0	0	0	0	13
New Mexico:											
Albuquerque	0	------	0	0	4	5	0	4	0	5	14
Utah:											
Salt Lake City	1	70	3	15	3	22	0	0	0	4	54
Nevada:											
Reno	------	------	--------	------	------	------	------	-------	------	------	--------
Washington:											
Seattle	0	331	2	15	17	1	0	6	0	1	125
Spokane	0	4	4	1	8	6	0	0	0	4	42
Tacoma	0	------	3	0	3	5	0	0	0	0	30
Oregon:											
Portland	0	597	11	3	21	5	0	5	0	4	131
Salem	0	59	--------	0	-------	0	0	-------	0	3	--------
California:											
Los Angeles	15	972	14	13	56	41	0	35	0	68	511
Sacramento	2	218	0	3	8	14	1	3	0	0	50
San Francisco	1	720	19	0	38	16	0	14	0	32	308

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:				Virginia:			
Boston	0	1	0	Lynchburg	1	1	0
New York:				North Carolina:			
Buffalo	1	0	0	Raleigh	0	1	0
New York	12	0	0	South Carolina:			
Pennsylvania:				Florence	0	1	0
Philadelphia	1	0	0	Greenville	0	1	0
Pittsburgh	3	2	0	Georgia:			
Ohio:				Atlanta	3	0	0
Cleveland	1	0	0	Arkansas:			
Illinois:				Forth Smith	1	0	1
Chicago	3	3	0	Louisiana:			
Springfield	1	1	0	Shreveport	0	1	0
Michigan:				Oklahoma:			
Detroit	2	1	0	Oklahoma City	1	0	0
Missouri:				Texas:			
Kansas City	0	1	0	Dallas	1	1	0
St. Louis	0	1	0	Galveston	1	0	0
North Dakota:				Washington:			
Minot	1	0	0	Seattle	1	0	0
Maryland:				Spokane	1	0	0
Baltimore	4	2	0	California:			
District of Columbia:				Los Angeles	2	0	1
Washington	4	0	0				

Dengue.—Cases: Charleston, S. C., 2.
Encephalitis, epidemic or lethargic.—Cases: Springfield, Mass., 1; New York, 2.
Pellagra.—Cases: Charleston, S. C., 1; Savannah, 1; Mobile, 3; Dallas, 1.
Typhus fever.—Cases: Charleston, S. C., 1; Atlanta, 1; Savannah, 2; Tampa, 1.

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FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—4 weeks ended January 16, 1937.—During the 4 weeks ended January 16, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	26	1	Scarlet fever	1	
Malaria	[1] 42	1	Tuberculosis	14	4
Poliomyelitis	[1] 4		Typhoid fever	[1] 23	3

[1] Includes imported cases.

FINLAND

Communicable diseases—December 1936.—During the month of December 1936, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	549	Scarlet fever	1,321
Dysentery	15	Smallpox	1
Influenza	2,666	Typhoid fever	42
Paratyphoid fever	16	Undulant fever	1
Poliomyelitis	15		

PANAMA CANAL ZONE

Notifiable diseases—October, November, and December, 1936.—During the months of October, November, and December, 1936, certain notifiable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	October		November		December	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	3		7		2	
Diphtheria	13		23		25	
Dysentery (amoebic)	14		2	3	15	
Dysentery (bacillary)	13	7	4	5	18	3
Leprosy	1	1	1			1
Lethargic encephalitis	1					
Malaria	67	2	69	6	59	4
Measles	53	1	68		127	
Meningococcus meningitis					2	1
Mumps	24		20		50	
Pneumonia		24		22		25
Scarlet fever					1	
Tuberculosis		31		23		25
Typhoid fever			1			
Whooping cough	2		1	2	5	1

VIRGIN ISLANDS

Notifiable diseases—October–December 1936.—During the months of October, November, and December, 1936, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	October	November	December	Disease	October	November	December
Diphtheria	1	1		Mumps		150	150
Filariasis	6			Pellagra	1		
Gonorrhea	8	10	3	Schistosomiasis			1
Hookworm disease	9	2	1	Syphilis	8	1	8
Leprosy	2		1	Tuberculosis	2	2	
Malaria	2	6	62				

YUGOSLAVIA

Communicable diseases—December 1936.—During the month of December 1936, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	42	6	Poliomyelitis	6	2
Cerebrospinal meningitis	17	9	Scarlet fever	480	10
Diphtheria and croup	1,014	105	Sepsis	15	7
Dysentery	21	2	Tetanus	18	10
Erysipelas	335	11	Typhoid fever	370	45
Measles	518	3	Typhus fever	49	7
Paratyphoid fever	5	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for January 29, 1937, pages 143–155. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued February 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau sector.—One rat found on January 6, 1937, four rats found on January 25, and two other rats found on January 28, 1937, all in Paauhau sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been found plague infected.

Smallpox

On vessel—American S. S. "Colorado Springs"—Manila.—One case of smallpox was found in a member of the crew of the American steamship *Colorado Springs* on arrival at Manila, P. I., February 1, 1937, from Shanghai via Nanking, China. All necessary measures were taken.

Typhus fever

Iraq—Baghdad.—During the week ended January 16, 1937, one case of typhus fever was reported at Baghdad, Iraq.

Yellow fever

Brazil—Matto Grosso State—Maracaju.—During the week ended January 2, 1937, two deaths from yellow fever were reported in Maracaju, Matto Grosso State, Brazil.

Gold Coast—Teshi.—One fatal case of yellow fever occurring on January 23, 1937, has been reported in Teshi, Gold Coast.

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which form they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

VOL. 52 FEBRUARY 19, 1937 NO. 8

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

January 3–30, 1937 [2]

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—The small outbreak of influenza which occurred during the month of January is comparable in size to the epidemic of the winter of 1932–33. Mortality from influenza and pneumonia in 95 large cities of the United States showed a maximum excess, for the week of January 3–9, of 146 per 1,000 over that for the corresponding week of 1934, a year of average influenza incidence. During the minor epidemic of the winter of 1932–33 the corresponding maximum excess for all cities was 164 per 1,000.

In each section of the country mortality from influenza and pneumonia has been above the seasonal expectancy—the highest above in the West North Central, Mountain, and Pacific areas (table 1). The week of maximum excess was January 10–16 in the West North Central and Mountain sections and January 17–23, the last week for which mortality data are available, in the Pacific area.

Approximately 100,000 cases of influenza were reported in the United States in excess of seasonal expectancy during the month of January. For the week of January 31–February 6 the number of reported cases for the country as a whole was, for the first time since the epidemic started, less than that for the preceding week. Only the New England, South Atlantic, and West South Central sections show a slight increase during the week of January 31–February 6 over the number reported for the preceding week.

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 46; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

[2] The data contained in these reports are based upon thirteen 4-week periods with the first week in each year ending between the 4th to the 10th of January. This of necessity makes an extra week in an occasional year over a period of years, as was the case in 1936. The first week used in the current 4-week period ended Jan. 9, that being the first 7-day week in 1937.

Mortality from all causes in 85 large cities reached a maximum of 15.8 per 1,000 during the week of January 3–9. Since January 9 the death rate has declined slowly. However, for the week ended February 6, mortality was still above seasonal expectancy—14.4 per 1,000 as compared with 12.3 for the corresponding week of 1934. In those sections in which mortality from influenza and pneumonia has shown a marked increase over normal, the death rate from all causes has dropped practically to normal for the last week for which data are available. In the New England, South Atlantic, and West South Central regions mortality from all causes has increased somewhat for the week ended February 6.

Number of cases of influenza and death rates from influenza and pneumonia and from all causes in each geographic area by weeks from Jan. 3 to Feb. 6, 1937 [1]

Regions	Week ended—												
	Jan. 9	Jan. 16	Jan. 23	Jan. 30	Feb. 6	Jan. 9	Jan. 16	Jan. 23 [2]	Jan. 9	Jan. 16	Jan. 23	Jan. 30	Feb. 6
	Number of reported cases in States					Death rate (annual basis) from influenza and pneumonia in 95 large cities, per 1,000 population			Death rate (annual basis) from all causes in 85 large cities per 1,000 population				
All regions: [3]													
1937	12,145	23,270	35,953	36,742	32,078	307	292	279	15.8	15.4	14.8	14.9	14.4
1934 [4]	2,051	2,804	1,943	2,201	2,714	161	159	151	13.0	12.8	12.3	12.2	12.3
New England:													
1937	108	1,102	1,363	1,368	2,231	238	279	290	15.8	15.5	15.4	15.4	17.4
1934	35	21	14	44	6	199	177	189	15.7	15.8	14.7	13.8	13.5
Middle Atlantic:													
1937	1,901	1,271	788	371	236	293	299	290	15.3	15.1	14.4	14.0	13.1
1934	48	42	51	55	56	155	154	138	13.0	12.6	11.9	12.1	12.0
East North Central:													
1937	1,467	2,445	3,509	2,589	1,849	324	246	171	14.7	13.2	11.5	11.9	12.2
1934	143	250	163	166	301	128	145	130	11.2	11.7	10.5	10.3	11.2
West North Central:													
1937	4,535	7,907	9,007	6,729	4,747	372	464	449	17.7	19.0	18.7	16.7	15.2
1934	27	30	46	69	73	258	209	232	13.9	12.9	15.2	13.7	13.4
South Atlantic:													
1937	921	1,120	2,934	2,338	3,421	302	318	298	18.7	18.7	16.5	17.5	17.9
1934	1,102	809	926	1,088	1,211	194	210	228	16.9	16.1	16.0	16.6	15.4
East South Central:													
1937	568	1,656	1,145	1,119	1,334	390	209	289	17.2	15.4	15.0	14.3	17.8
1934	168	127	212	309	326	217	149	54	13.7	15.0	12.7	15.0	14.5
West South Central:													
1937	1,226	2,076	3,750	4,039	6,301	284	262	321	14.4	15.2	15.1	16.4	17.4
1934	400	1,415	453	368	609	229	164	208	15.4	13.5	14.5	14.6	13.8
Mountain:													
1937	1,058	3,599	4,697	5,694	2,656	813	936	618	29.1	28.4	27.5	22.7	16.8
1934	38	31	19	30	61	120	189	137	13.6	14.9	14.8	14.9	16.0
Pacific:													
1937	361	2,094	8,760	12,495	9,303	179	154	320	16.2	16.8	19.0	21.6	17.9
1934	90	79	59	72	71	111	117	97	13.3	12.5	13.1	12.2	12.4

[1] For similar tables see PUBLIC HEALTH REPORTS for Jan. 15, 1937, p. 68; Jan. 29, p. 126; and Feb. 12, p. 190.
[2] The latest data available.
[3] No reports were received from Massachusetts, Mississippi, Nevada, up-State New York, Pennsylvania, Vermont, and Virginia, nor from Kentucky in 1937 since the week ended January 16. New York City is included.
[4] Reported cases for the corresponding weeks of 1934, the winter of 1933–34 being one of average influenza incidence.

Smallpox.—Smallpox continued unusually prevalent in the North Central regions. Of the total of 1,144 cases for the entire reporting area, 194 occurred in the East North Central region and 621 (279 in Missouri) in the West North Central region. New York State reported 46 cases for the current 4-week period, as compared with none for the corresponding period since 1932. Owing largely to the high incidence in the North Central and Mountain and Pacific regions, the incidence of smallpox for the country as a whole has shown a gradual increase since 1934. The total numbers of cases for the periods corresponding to the current one were as follows: 498 in 1934, 757 in 1935, and 865 in 1936.

Scarlet fever.—Reports indicate that the incidence of scarlet fever might be slightly above the seasonal expectancy. While the number of cases (23,617) for the current 4-week period was only about 80 percent of the figure for the corresponding period in 1936, and about 90 percent of that for 1935, the average for this period in the 6 preceding years was approximately 20,000 cases. During the latter part of December 1934 a rise in scarlet fever became apparent, particularly in the East North Central region, and spread over practically all sections of the country. In each section the incidence has dropped from the high levels reached during the past 2 years, but the South Atlantic region is the only one in which the number of cases has dropped below the average for several preceding years.

Meningococcus meningitis.—For the current 4-week period 542 cases of meningococcus meningitis were reported. Although the number is approximately 20 percent less than the figure for the corresponding period in 1936, it is about twice the number reported for this period in 1934 and 1935. Nearly a 40-percent excess in cases over last year was reported from the South Atlantic region, but in all other regions the disease was less prevalent. The incidence of meningitis stood at a relatively high level during the year 1936.

Measles.—The number of cases (16,688) of measles reported during the 4 weeks ended January 30 was the lowest for this period in the 9 years for which these data are available. Of the various geographic regions, the New England, Middle Atlantic, South Atlantic, and South Central regions reported slight increases over the totals for the corresponding period in 1936, but the North Central, Mountain, and Pacific regions reported the lowest incidence in recent years.

Diphtheria.—For the entire reporting area, diphtheria continued at a low level. For the current 4-week period 2,489 cases were reported, as compared with 3,001, 3,385, and 4,259 for the corresponding period in the years 1936, 1935, and 1934, respectively. Each geographic region, except the South Atlantic, reported the lowest incidence in recent years. In the South Atlantic region the number of cases (609)

represented an increase over each of the 2 preceding years and was only slightly below the average for the years 1929–34, inclusive.

Typhoid fever.—The incidence of typhoid fever (487 cases) was slightly higher than during the corresponding period in 1936. The increase was due largely to increases in only a few States. Texas reported 51 cases as compared with 18 for this period last year, Louisiana 129 as compared with 14, Maine 27 as compared with 1, and Tennessee 21 as compared with 8. The incidence in relation to that of last year was high in the North Atlantic and South Central regions, where the States mentioned are located, but in other regions the number of cases was about on a level with that of last year. For the entire reporting area the excess over last year was about 12 percent; in the years 1935 and 1934 the numbers of cases for this period totaled 629 and 658, respectively.

Poliomyelitis.—The incidence of poliomyelitis stood at about the average level of recent years. For the 4 weeks ended January 30 a total of 100 cases was reported, as compared with 77, 118, and 98 for the corresponding period in the years 1936, 1935, and 1934, respectively. While the number of cases (28) reported by the South Central States was not expecially high, it appeared to be slightly above the seasonal expectancy. In other regions the incidence was about normal.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended January 30, based on data received from the Census Bureau, was 15.2 per 1,000 inhabitants (annual basis), as compared with 13.4, 13.3, and 12.8 for the corresponding period in the years 1936, 1935, and 1934, respectively. The current rate represents an excess of 2.0 per 1,000 over the average for the 3 preceding years. The excess is accounted for by the comparatively high death rate from influenza and pneumonia.

PULMONARY TUMORS IN MICE

I. The Susceptibility of the Lungs of Albino Mice to the Carcinogenic Action of 1, 2, 5, 6–Dibenzanthracene [1]

By H. B. Andervont, *Biologist, United States Public Health Service, Office of Cancer Investigations, Harvard Medical School*

It has been known for years that the cutaneous application of tar or tar products induces pulmonary tumors in mice. Murphy and Sturm (*30*) first demonstrated this carcinogenic action of tar by an ingenious experiment in which they painted 12 different areas on each mouse in rotation. Each area was painted three times, so that each animal received 36 applications of a coal-tar distillate over a period of 83 days. In three such experiments they painted over 60

[1] From the Office of Cancer Investigations, U. S. Public Health Service, Harvard Medical School, Boston, Mass.

mice, of which 40 survived or were killed 1 to 6 months after the last tar application, and of these 85 percent had lung tumors. As controls, they set aside 38 untreated mice of the same stock which they killed at the same time that they killed the experimental mice. None of the controls had lung tumors. Murphy and Sturm discuss the appearance of spontaneous lung tumors in their stocks and state that—

> It is rare to find a lung tumor in animals 12 months old or younger, while the highest rate comes between 26 and 29 months of age. In case of two special strains, with a lung tumor rate of between 59 and 70 percent, in only one instance has a tumor occurred in a mouse as young as 13 months, while the average age is about 20 months.

Since the oldest experimental mouse they killed was 13 months of age, it is obvious that all were below the age at which tumors occurred normally in even the high lung tumor strains.

The authors suggest two possibilities as regards the appearance of lung tumors. The first postulates that tar particles are carried to the lungs after entering the body through the skin or by way of the alimentary tract; the second is best stated in their own words, as follows: "Tar painting so alters the body state that tumors occur at points of incidental irritation at which under ordinary circumstances they would not develop." They are inclined to favor the second possibility.

Results similar to those of Murphy and Sturm have been obtained in many laboratories. Dreifuss and Bloch (*16*) found tumors in the lungs of tarred mice and considered them metastases or primary tumors. DeJongh (*15*) records the appearance of lung tumors in mice bearing induced or transplanted tar tumors. Bonne (*6, 7, 8, 9*) gave the problem special consideration and confirmed the findings of Murphy and Sturm. In 300 tarred mice of 5 to 23 months of age he found 40 with lung growths, while in 146 untreated controls of the same age he found 12 with lung tumors. No lung tumors were found in 59 of the untarred controls which were less than 1 year of age, while 14 of 227 tarred mice developed lung tumors before they were 1 year old. Because he found spontaneous pulmonary tumors in his control animals he was inclined to believe that tarring hastened a process which had already begun.

Lynch (*19, 20, 21, 22*) found that tar painting increased the incidence of lung tumors in various strains of mice. The results obtained by tar painting the offspring of certain backcross breeding experiments showed that the susceptibility to induced lung tumors was hereditary. In discussing the origin of lung tumors in tarred mice, Lynch (*20*) states that "It is probable that the tar treatment plays the same rôle of excitant in the production of lung tumor that breeding does in the instance * * * of mammary gland tumor."

While studying the systemic and local effects of tar painting in mice, Schabad (*32, 33, 34, 35*) also found that lung tumors arose more frequently in tarred than in normal mice of his strains. In a recent publication (*36*) he summarizes his findings and considers the origin of lung tumors as being the result of a "general blastogenic action" of the carcinogenic substance.

Die Entstehung von Tumoren in einem fern von der Einführungsstelle liegenden Organ, ihre grosse Häufigkeit bei vollständiger Abwesenheit solcher Geschwülste bei Kontrollmäusen desselben Stammes und das frühe Auftreten der Adenome—kann nur durch die Annahme einer allgemeinen blastogenen Wirkung des eingeführten kanzerogenen Stoffes erklärt werden.

Mercier (*26, 27, 28, 29*) records the appearance of massive lymphadenoma of the lung in 10 of 104 mice of a certain strain, of which 36 had been given intraperitoneal injections of tar in olive oil. Six of the tumors arose in the 36 tar-treated animals, while the remaining 4 appeared in the 68 untreated mice. The tumors appeared within 8 to 11 months in each group, indicating that tar did not hasten the appearance of tumors as is the case in tar-painted mice. The difference between the rate of appearance of tumors in the treated and control mice in this group is not sufficient to eliminate the possibility that all tumors arose spontaneously. Koose and Cordes (*17*) tarred the skin of 690 mice and induced lung tumors in 40 while no tumors occurred in over 700 controls. They offer the suggestion that an agent such as bacteriophage or a product of cellular activity is carried to the lungs from the tarred area and causes tumors. Watson and Mellanby (*41*) produced skin tumors in 264 mice by tar painting and found that 52.4 percent contained "typical" nodules of the lung. They say that "In the majority of cases the lung nodules of the mice with skin tumours consist of squamous epitheliomata, secondary to the primary tumour, or primary epithelial lung tumours of an adenomatous type." They found lung tumors in 6 percent of their normal untarred mice. Cirio and Balestra (*13*) found tumors in the lungs of mice after irradiation plus tarring or after tarring alone. In discussing the results of a series of tar-painting experiments Rous and Botsford (*31*) mention that the appearance of lung tumors in mice was "not rare"! Kreyberg (*18*) used 975 mice of his "White Label" strain for tar painting, but does not comment upon the occurrence of lung tumors, although a chart shows that lung adenoma arose in some of these animals.

Campbell (*10, 11*) exposed mice to air laden with dust obtained from the sweepings of tarred roads; and of 100 mice which inhaled the dust, 71 developed primary lung tumors while similar tumors arose in only 7 of 90 unexposed controls. His results are of interest because they show that, in mice, direct contact of tar with lung tissue induces tumor formation. Seelig and Benignus (*38*) kept 100 mice in a bedding of soot and found 8 lung tumors when the animals came to autopsy.

The ages of these mice ranged from 12 to 21 months when the lung tumors were observed. In 50 controls they found one animal with a spontaneous pulmonary tumor.

Other investigators have failed to find lung tumors in mice after tar painting. For example, Cramer (*14*), of the Laboratories of the Imperial Cancer Research Fund, reports that "In the induction of cancer by tar-painting the tumour appears almost without exception in the painted areas. In the large number of experiments of tar-painting in mice in this laboratory only three instances have occurred when a tumour appeared outside of the area actually painted."

In this laboratory (*1, 2*) it has been found that lung tumors appear in certain mice following the subcutaneous injection of a lard–dibenzanthracene solution. Schabad (*37*) and Lynch (*23*) have obtained similar results with 1, 2, 5, 6–dibenzanthracene. Shear (*39*) found lung nodules in mice after a subcutaneous injection of crystalline 8, 9–dimethylene–1, 2–benzanthracene. The appearance of pulmonary tumors following subcutaneous injection may be of significance, for in these experiments there is no known opportunity for the inhalation or ingestion of the carcinogenic compound.

In a previous communication (*2*) it was stated that with few exceptions, the induced lung tumors arose in albino mice regardless of whether the animals were members of a highly inbred strain or ordinary "market mice". A review of the literature pertaining to the production of lung growths in mice by tar or 1, 2, 5, 6-dibenzanthracene reveals that most of the investigators who describe the coat color of their experimental animals employed albinos. Dreifuss and Bloch (*16*), deJongh (*15*), Bonne (*6*), Schabad (*32*), Koose and Cordes (*17*), Cirio and Balestra (*13*), Rous and Botsford (*31*), Kreyberg (*18*), Seelig and Benignus (*38*), and Shear (*39*) record that albino mice were used in their investigations. Lynch obtained lung tumors in both colored and albino mice, but the albino stock exhibited a much higher rate than the colored. Campbell (*12*) also used colored mice but states that "We have used a large proportion of white mice distributed throughout the groups." Murphy and Sturm, Mercier, Watson and Mellanby did not record the color of their mice.

It is also pertinent to mention that Lynch (*24, 25*) and Bittner (*5*) have described strains of albino mice which have a high incidence of spontaneous pulmonary tumors. Of course, albino coat color *per se* cannot be responsible for the appearance of lung tumors, for Tyzzer (*40*) in one of his earliest reports concerning the spontaneous occurrence of these growths, records their appearance in colored mice, and the work of Lynch has shown that they may be induced in colored mice. In this laboratory (*3*) lung tumors have appeared in mice of black coat color following subcutaneous injection of a lard–dibenzanthracene solution. These animals were the offspring of crossbreeding

between pure strains of albino and black mice. It may be said, however, that up to the present time experimental evidence indicates that albino mice or their offspring are more susceptible to the development of spontaneous or induced lung tumors than are colored mice. Further investigations are necessary before any significance can be attached to this observation. It is not impossible that the albino mice used in laboratories throughout the world are distantly if not closely related.

It has been noted that practically all investigators have found spontaneous growths in the lungs of control mice belonging to the stocks which proved to be susceptible to pulmonary growths induced by tar painting. These findings imply that lung tumors can be induced more frequently in those strains which possess a tendency to develop them spontaneously. Pure strain mice obtained from the Roscoe B. Jackson Memorial Laboratory have been used in studies pertaining to the appearance of induced lung growths in this laboratory. Mice of strains A, D, M, Y, C_3H, CBA, C_{57} Black, and C_{57} Brown have been given subcutaneous injections of lard–dibenzanthracene solution, and thus far the lungs of only strain A mice have proved to be very susceptible to this carcinogenic agent. Furthermore, these mice are the only strain of this series which are known to exhibit a high rate of spontaneous lung tumors. Bittner (*5*) has published the most complete data on the occurrence of spontaneous lung growths in strain A mice. He found that of 126 virgin females 77 percent developed pulmonary growths, the average age at autopsy being 16.6 months. Of 116 breeding males, 71.6 percent possessed lung growths when coming to autopsy at an average age of 14.8 months. It would appear that, as in the case of tar-induced lung tumors, the test animals must possess a special organ susceptibility to tumor growth before the carcinogenic hydrocarbon is able to elicit lung tumors in any considerable number. However, a method has been devised in this laboratory (*4*) whereby lung tumors have been induced in a significant percentage of mice belonging to a strain which exhibits few, if any, spontaneous lung tumors.

The fact that carcinogenic substances evoke lung tumors more frequently in those mice which possess a tendency to develop them spontaneously creates special problems as regards adequately controlled experiments. The obvious procedure is to employ mice which are below the age incidence at which the spontaneous growths appear, and most investigators have taken this precaution. In this laboratory the rule has been to use only those mice of strain A which will be from 7 to 8 months of age at the conclusion of the experiment. The manner in which such investigations have been controlled is best shown by presenting brief protocols of two experiments.

Experiment 1

On April 18, 1935, 40 strain A females of approximately 2 months of age received a subcutaneous injection of a lard-dibenzanthracene solution in the right axillary region. The injected material contained 4 mg of 1, 2, 5, 6-dibenzanthracene to each cubic centimeter of lard and each mouse received 0.2 cc of the solution. Twenty-one female mice of the same lot were set aside as controls. The injections were repeated on April 26, 1935.

The first subcutaneous tumor appeared on August 15, 1935. As the injected mice developed subcutaneous tumors or died from other causes, they were examined macroscopically for the presence of lung tumors. The last 7 injected mice were killed on November 22, 1935, approximately 7 months after the first injection. None of these animals had developed a subcutaneous tumor, but all exhibited a large number of lung nodules.

From November 22, 1935, to December 3, 1935, groups of the uninjected controls were killed and examined for lung tumor. Four of them had pulmonary tumors which, in each instance, consisted of a single nodule about 2 mm in diameter. In contrast to these single growths, practically all the lungs of the injected mice contained numerous nodules, showing that the carcinogenic agent increased the number of lung tumors and accelerated their appearance in this strain of mice. The results of the experiment are summarized in table 1.

TABLE 1.—*Experiment 1: The response of strain A mice to the subcutaneous injection of 1.6 mg of 1, 2, 5, 6-dibenzanthracene in a lard solution*

	Number of mice used	Number which developed subcutaneous tumor only	Number which developed both subcutaneous tumor and lung tumors	Number which developed lung tumors only	Number which died or were killed without tumors
Injected mice	40	10	18	7	5
Control mice	21	0	0	4	17

Experiment 2

Albino female mice purchased from a local dealer and not of a pure strain were used in this investigation. Their exact age was not known, but they were young adults averaging 20 g in weight. On June 12, 1935, 55 mice each received 0.2 cc of a lard-dibenzanthracene solution in the right axillary region. The lard contained 4 mg of 1, 2, 5, 6-dibenzanthracene to each cc. Thirty-four mice of the same shipment were set aside as controls. The injections were repeated on June 21, 1935.

The first tumor appeared on September 12, 1935. As in experiment 1, the mice developing subcutaneous tumors or dying from other

causes were examined macroscopically for the presence of lung growths. On December 12, 1935, 19 of the injected mice were alive. These were killed and autopsies performed. One had a subcutaneous tumor only, 1 had both a subcutaneous tumor and lung tumors, 10 had lung nodules only and 7 were negative in both axilla and lungs. The control mice were killed in three equal groups—the first on November 14, 1935, the second on November 26, 1935, and the last on December 12, 1935. Only one of these controls had a pulmonary tumor, a single lung nodule 3 mm in diameter. As in experiment 1, the lungs of the injected mice contained numerous nodules. The results of this experiment are presented in table 2.

TABLE 2.—*Experiment 2: The response of stock albino mice to the subcutaneous injection of 1.6 mg of 1, 2, 5, 6–dibenzanthracene in a lard solution*

	Number of mice used	Number which developed subcutaneous tumor only	Number which developed both subcutaneous tumor and lung tumors	Number which developed lung tumors only	Number which died or were killed without tumor
Injected mice	55	8	27	11	9
Control mice	34	0	0	1	33

It is seen that in both of these investigations only lung tumors were present in most of the injected mice killed at the conclusion of the experiments. This finding suggested that the lungs of these albino mice may have been more susceptible to the carcinogenic action of 1, 2, 5, 6–dibenzanthracene than the subcutaneous tissue. Two experiments have been performed and the results show that, so far as strain A mice were concerned, subcutaneous injection of the carcinogenic agent evoked lung tumors earlier than subcutaneous tumors. These experiments are described below.

Experiment 3

Forty female strain A mice and 30 female strain M mice approximately 3 months of age were used. On April 24, 1936, each of these animals received a subcutaneous injection in the right axillary region of 0.25 cc of lard containing 1 mg of 1, 2, 5, 6–dibenzanthracene. The injection was repeated on May 8, 1936.

May 25, 1936: Three strain A and three strain M mice were killed and autopsies performed. All were tumor free.

June 24, 1936: Three more mice of each strain were killed. The lungs of one strain A mouse contained a single lung nodule. The other 5 animals were tumor free.

July 9, 1936: Three strain A and three strain M mice were killed. All three strain A animals had numerous small nodules in their lungs. The strain M mice had no tumors in any organ.

July 27, 1936: Three more mice of each strain were killed. All three strain A mice had many lung nodules, while all three strain M animals were tumor free.

August 10, 1936: Two mice of each strain were killed. Again both strain A mice had multiple lung nodules, while both strain M mice were free from tumor.

On August 7, 1936, the first definite subcutaneous tumor was palpable in a strain A mouse. All surviving mice were killed on August 24, 1936, at which time 23 strain A and 16 strain M animals were alive. The results of these autopsies are presented below:

	Strain A mice	*Strain M mice*
No tumor in either subcutaneous tissue or lungs	1	9
Lung tumors only	18	0
Subcutaneous tumors only	0	7
Tumors in both subcutaneous tissue and lungs	4	0

From the above summary it is seen that 22 of the 23 strain A mice had lung tumors, while only 4 had a subcutaneous growth at the site of injection. These results show that, following subcutaneous injection of a lard-dibenzanthracene solution, the lungs of most strain A mice developed multiple tumors before a tumor arose in the tissues at the site of injection. Another experiment has been conducted which is presented as further evidence along these lines.

Experiment 4

Twenty-six strain A female mice, approximately 3 months old, were used as test animals. On August 9, 1936, each animal received 0.2 cc of a lard-dibenzanthracene solution in the subcutaneous tissue of the right axillary region. The solution contained 4 mg of 1, 2, 5, 6–dibenzanthracene to each cc of lard; thus, each mouse received 0.8 mg of 1, 2, 5, 6–dibenzanthracene. One mouse died on August 29, 1936, and no tumors were visible in its lungs. Another died on October 8, 1936, and its lungs were also negative when examined macroscopically.

On November 6, 1936, 16 of the mice were killed and examined for the presence of tumors at the site of injection and in the lungs. None had a tumor in the subcutaneous tissue, one was negative in both lungs and subcutaneous tissue, one had a single lung nodule, and the remaining 14 exhibited numerous lung growths. The remaining 8 mice were killed and autopsies performed on November 14, 1936. All had multiple pulmonary nodules but showed no evidence of tumor at the site of injection. The results may be summarized as follows: Of 28 strain A female mice which had received a single subcutaneous injection of 0.8 mg of 1, 2, 5, 6–dibenzanthracene in lard, 26 were alive 3 months later, and of these, all but one exhibited lung tumors while none had developed a subcutaneous growth.

DISCUSSION

In these experiments mice of strain A were given subcutaneous injections of a lard-dibenzanthracene solution. It was found that more of these animals developed lung tumors than subcutaneous tumors and, in addition, that the lung tumors arose earlier than did the subcutaneous growths. Hence it would appear that the lungs of these mice were more delicate test objects than the subcutaneous tissues for the carcinogenic activity of 1, 2, 5, 6–dibenzanthracene.

The reason for the appearance of lung tumors in mice painted with tar or injected with carcinogenic compounds is unknown. The observations recorded in this paper indicate that in strain A mice the lung response occurred in a relatively short period of time. While it does not appear likely that 0.8 mg of 1, 2, 5, 6–dibenzanthracene in 0.2 cc of lard was capable of altering the body state of mice to such an extent that lung tumors arose so much earlier than under normal conditions, it is not impossible that very small amounts of a carcinogenic agent left the site of injection and came into contact with the tissues of an organ which are known to be extremely susceptible to tumor growth.

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THE DETERMINATION OF MERCURY IN CARROTED FUR [1]

By F. H. Goldman, *Associate Chemist, United States Public Health Service*

In the course of an investigation of chronic mercurialism in the hatters' fur-cutting industry,[2] it was found necessary to analyze samples of fur dust. At an early stage in the process of preparing the fur of rabbits and hares for the subsequent manufacture of felt hats, the pelts are treated with a solution made by dissolving mercury in nitric acid. This process, called carroting, appears to alter the physical properties of the fur so that it mats together under the application of moisture, heat, and pressure to form a firm felt. Workmen who handle carroted fur are exposed not only to mercury vapor arising from the treated fur, but also to quantities of mercury-impregnated dust. To obtain a measure of the amounts of mercury contained in dust suspended in the air of workrooms, samples were collected by drawing 2 cubic meters of air through 100 cc of an alcohol-water mixture (1: 3) in an impinger.[3] In all, 130 samples were collected, and each sample contained, on the average, 0.3 mg of mercury.

This problem presented two important aspects: First it was necessary to destroy the organic matter (which consisted mainly of fur) and obtain a homogeneous solution; then it was necessary to find a chemical method of analysis. Procedures requiring prolonged heating cause the loss of appreciable quantities of mercury. However, by using potassium permanganate and sulphuric acid and heating for a relatively short time it was found that the loss of mercury was very small and could be detected only by spectrographic methods. In control samples containing 0.02 mg of mercury and treated by this method the mercury could be estimated without loss.

The samples treated in this way were then prepared for electrolyzing and the mercury was plated out as described by Fraser.[4]

[1] From the Industrial Hygiene Laboratory of the Office of Industrial Hygiene and Sanitation, U. S. Public Health Service.

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EXPERIMENTAL

The samples were handled in batches of six. They were first transferred to Kjeldahl flasks and the alcohol was boiled off very rapidly. This took only 5 to 10 minutes. After allowing to cool, 10 cc of concentrated sulphuric acid and 4 grams of potassium permanganate were added. The necks of the flasks were washed down with water, and the samples were allowed to digest just under the boiling point for 2 hours. They were then decolorized with oxalic acid (about 3 grams are necessary). Unless the solution is cold, it is better to add the oxalic acid in small amounts during this operation. When the decolorization was nearly complete, the flasks were heated to about 70° C. and the addition of oxalic acid was continued until the solution became colorless.

The contents of the Kjeldahl flasks were next transferred to glass-stoppered Erlenmeyer flasks; 1 cc of 0.5 percent copper sulphate solution was added to each sample, and then hydrogen sulphide was passed in. The flasks were heated and the sulphiding was continued until the flasks had cooled. The precipitate of copper and mercury sulphides was allowed to stand overnight. It was then filtered and washed by centrifuging. Chlorine gas was then bubbled into the centrifuge cup containing the precipitate, to which 5 cc of water had been added. Solution was usually effected in 15 minutes, after which air was passed through to remove the chlorine.

These solutions were transferred to 50-cc beakers, and 2 cc of saturated oxalic acid plus 5 cc of 4 percent ammonium oxalate were added to each. The mercury was plated out using a pure gold cathode 1 by 3 cm and ¼ mm thick. The anode was platinum. The potential was kept at 1.3 to 1.5 volts, and the time was 18 to 24 hours. The gold electrode can be easily prepared in the laboratory. A piece of gold foil was cut to the above dimensions and was welded to a platinum wire by heating wire and foil in position on an anvil with a small flame, and then tapping gently with a small hammer. Care must be taken not to melt the gold by excessive heating. The set-up for the electrolysis consisted of a manifold of 6 sets of electrodes, and the source of current was 2 cells of a large lead storage battery with a variable resistance (such as is used in radio sets) in series.

Upon completion of electrolysis the cathode with the mercury and copper plated out on it was washed by dipping in water, alcohol, and ether successively. It was then hung up to dry for 5 minutes on a small rack consisting of a supported glass rod, and was weighed on a microbalance. A semi-microbalance can also be used.

After weighing the electrode it was placed in a Pyrex combustion tube through which a stream of hydrogen was passed. The tube was heated carefully and the mercury driven off. When the tube was

cold, the hydrogen was shut off. The electrode was removed and weighed, and the mercury was determined by difference.

Duplicate samples checked within 0.02 of a milligram. The mean and average deviation of 20 analyses of uncarroted fur dust, presumably Hg-free, was 0.020 ± 0.005. This blank was substracted from the other analytical values obtained.

The results of 10 analyses of pure solutions of mercuric nitrate of known concentration are shown in table 1.

TABLE 1.—*Analyses of solutions containing known amounts of mercury nitrate*

Milligrams of mercury	
Actually used	Found
0.150	0.140
0.150	.147
0.150	.154
0.150	.153
0.250	.250
0.200	.202
0.201	.190
0.050	.060
0.360	.359
0.180	.166

Table 2 gives the results of 10 analyses of samples of fur dust collected with the impinger apparatus in factory workrooms.

TABLE 2.—*Representative analyses of samples of carroted fur dust collected with the impinger*

Sample no.	Milligrams of mercury
1	0.20
2	.54
3	.45
4	.74
5	.63
6	.28
7	.13
8	.29
9	.17
10	.46

DEATHS DURING WEEK ENDED JAN. 30, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 30, 1937	Corresponding week, 1936
Data from 85 large cities of the United States:		
Total deaths	10,682	10,579
Average for 3 prior years	8,811	
Total deaths, first 4 weeks of year	43,601	37,682
Deaths under 1 year of age	616	626
Average for 3 prior years	535	
Deaths under 1 year of age, first 4 weeks of year	2,593	2,261
Data from industrial insurance companies:		
Policies in force	69,041,422	67,819,150
Number of death claims	15,769	13,775
Death claims per 1,000 policies in force, annual rate	11.9	10.6
Death claims per 1,000 policies, first 4 weeks of year, annual rate	11.8	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 6, 1937, and Feb. 8, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 6, 1937, and Feb. 8, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936
New England States:								
Maine	1	2	1,688	8	26	424	0	2
New Hampshire			7		86	18	0	0
Vermont					4	191	0	0
Massachusetts	4	3			903	435	3	2
Rhode Island	1	1			198	99	0	0
Connecticut	3	1	536	4	346	124	1	1
Middle Atlantic States:								
New York	46	54	[1] 119	[1] 60	299	1,408	14	14
New Jersey	17	11	117	11	708	61	3	4
Pennsylvania	52	46			209	283	8	6
East North Central States:								
Ohio	46	27	242	20	66	181	7	7
Indiana	16	43	294	52	9	32	2	6
Illinois	46	36	275	43	11	30	9	15
Michigan	9	9	10	3	35	42	2	7
Wisconsin	1	4	1,028	56	23	81	1	2
West North Central States:								
Minnesota	4	4	4		29	120	0	2
Iowa	4	6	425	6	3	11	3	2
Missouri	25	22	1,487	184	15	17	7	8
North Dakota		2	363	3	1	1	4	0
South Dakota		5	94			4	2	1
Nebraska	7	2	48	5		51	0	1
Kansas	5	11	2,326	68	3	16	5	5
South Atlantic States:								
Delaware	1		7		173	74	0	0
Maryland [2]	8	5	308	7	309	112	5	11
District of Columbia	14	12	42	1	32	7	6	4
Virginia	31	22			183	37	5	11
West Virginia	21	17	1,313	151	10	2	5	2
North Carolina [3]	36	23	27	67	156	28	5	2
South Carolina [3]	3	2	968	1,009	40	10	2	2
Georgia [3]	8	10	763	490			4	0
Florida [3]	12	9	44	4	1	2	2	0
East South Central States:								
Kentucky		9		101		70		11
Tennessee [4]	19	10	720	176	14	29	4	6
Alabama [3]	15	12	614	334	2	25	0	0
Mississippi [3]	8	8					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 6, 1937, and Feb. 8, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936
West South Central States:								
Arkansas	3	12	946	166	2	2	1	0
Louisiana	14	13	291	31	6	96	0	0
Oklahoma [4]	10	9	874	285	4	1	4	7
Texas [3]	60	48	4,481	491	426	126	8	9
Mountain States:								
Montana	2	6	1,035	6	19	20	1	1
Idaho	1		184	8	76	50	0	1
Wyoming	1	1	80		1	5	0	0
Colorado	5	3			5	34	1	1
New Mexico	5	7	244	2	20	9	0	0
Arizona	5	4	1,113	175	294	13	0	0
Utah [2]	1				39	4	0	0
Pacific States:								
Washington	5	1	430		42	182	2	2
Oregon	1	5	1,111	33	11	616	1	1
California	33	46	7,762	522	91	1,336	9	9
Total	609	583	32,510	4,577	4,930	6,519	137	165
First 5 weeks of year	3,097	3,568	140,620	15,717	21,618	28,462	679	881

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936
New England States:								
Maine	0	0	25	47	0	0	2	0
New Hampshire	0	0	6	6	0	0	0	0
Vermont	0	2	81	16	0	0	0	0
Massachusetts	0	0	264	250	0	0	0	0
Rhode Island	0	0	64	30	0	0	0	1
Connecticut	0	0	106	69	0	0	0	2
Middle Atlantic States:								
New York	1	1	763	955	2	0	11	7
New Jersey	1	0	161	276	0	0	1	1
Pennsylvania	1	2	496	452	0	0	8	4
East North Central States:								
Ohio	0	0	408	304	9	3	3	3
Indiana	0	0	197	355	5	0	0	2
Illinois	1	0	628	756	31	12	6	2
Michigan	2	1	500	250	1	1	8	4
Wisconsin	0	0	295	646	21	11	1	4
West North Central States:								
Minnesota	0	0	151	315	3	12	0	1
Iowa	0	0	236	182	43	25	0	5
Missouri	0	4	268	145	63	17	2	0
North Dakota	0	0	40	86	13	2	1	1
South Dakota	0	0	75	30	11	14	0	0
Nebraska	0	0	79	188	4	53	0	0
Kansas	1	1	329	209	29	10	0	0
South Atlantic States:								
Delaware	0	0	6	7	0	0	0	0
Maryland [2]	0	0	41	73	0	0	3	1
District of Columbia	0	1	13	30	0	0	0	0
Virginia	1	0	45	40	0	0	12	8
West Virginia	1	1	46	42	0	0	5	2
North Carolina [3]	0	0	40	28	1	0	6	4
South Carolina [3]	0	0	10	3	0	0	2	0
Georgia [3]	6	0	20	19	0	0	3	1
Florida [3]	0	0	7	8	0	0	0	8

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 6, 1937, and Feb. 8, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936	Week ended Feb. 6, 1937	Week ended Feb. 8, 1936
East South Central States:								
Kentucky [4]		0		39		0		5
Tennessee	0	0	19	37	1	0	6	3
Alabama [3]	0	1	19	22	1	2	4	1
Mississippi [2]	3	0	7	11	1	0	1	1
West South Central States:								
Arkansas	2	0	10	18	2	0	1	1
Louisiana	0	0	5	15	0	0	6	2
Oklahoma [5]	0	1	34	21	0	2	7	2
Texas [3]	1	0	102	52	7	0	8	2
Mountain States:								
Montana	0	0	60	126	14	11	0	4
Idaho	0	0	13	75	8	2	0	2
Wyoming	0	0	15	101	11	5	1	0
Colorado	0	0	84	238	2	23	0	1
New Mexico	0	0	24	47	2	0	8	1
Arizona	0	0	22	22	0	0	0	0
Utah [2]	0	0	23	133	0	0	0	0
Pacific States:								
Washington	0	0	28	86	0	12	1	2
Oregon	0	1	45	45	20	2	0	0
California	2	2	273	421	8	0	4	2
Total	23	18	6,183	7,326	313	219	116	85
First 5 weeks of year	123	91	29,800	36,056	1,457	1,082	603	531

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 6, 1937, 12 cases, as follows: North Carolina, 3; South Carolina, 1; Georgia, 3; Florida, 1; Alabama, 2; Texas, 2.
[4] Report for week ended Feb. 6, 1937, not received.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1936										
Puerto Rico		46	63	924	98		1	1	0	148
December 1936										
Wisconsin	4	37	1,010		130		1	1,250	55	8
January 1937										
Arkansas	3	16	1,225	22	2	14	4	51		15
Connecticut	5	13	3,133		1,087		0	350	0	2
Delaware		11	160	1	592		0	52	0	1
North Carolina	13	168	231		273	11	2	216	2	22

November 1936

	Cases
Puerto Rico:	
Chicken pox	3
Dysentery	16
Filariasis	2
Leprosy	2
Mumps	4
Opthalmia neonatorum	1
Puerperal septicemia	8
Tetanus	7
Tetanus, infantile	1
Undulant fever	1
Whooping cough	49

December 1936

	Cases
Wisconsin:	
Chicken pox	2,676
Dysentery (amoebic)	1
Encephalitis, epidemic or lethargic	2
German measles	52
Mumps	642
Septic sore throat	19
Tularemia	10
Undulant fever	8
Whooping cough	537

January 1937

	Cases
Anthrax:	
Delaware	1
Chicken pox:	
Arkansas	50
Connecticut	804
Delaware	94
North Carolina	671
Conjunctivitis:	
Connecticut	6
Dysentery:	
Connecticut (bacillary)	1
North Carolina (bacillary)	1
Encephalitis, epidemic or lethargic:	
Connecticut	1
German measles:	
Connecticut	43
Delaware	1
North Carolina	93
Lead poisoning:	
Connecticut	1
Mumps:	
Arkansas	20
Connecticut	479
Delaware	6

January 1937—Continued

	Cases
Ophthalmia neonatorum:	
Connecticut	2
North Carolina	2
Paratyphoid fever:	
Connecticut	2
Septic sore throat:	
Connecticut	31
North Carolina	12
Trachoma:	
Arkansas	1
Trichinosis:	
Connecticut	2
Tularemia:	
Arkansas	3
North Carolina	4
Typhus fever:	
Connecticut	1
North Carolina	4
Undulant fever:	
Connecticut	8
North Carolina	2
Whooping cough:	
Arkansas	13
Connecticut	378
Delaware	22
North Carolina	259

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 30, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	0	2	4	0	0	0	4	32
New Hampshire:											
Concord	0		1	0	3	1	0	0	0	0	22
Manchester	0		1	0	1	0	0	1	0	0	13
Nashua	0			0	1	0	0		0	0	
Vermont:											
Barre											
Burlington	0		0	0	0	5	0	0	0	1	19
Rutland	0		0	1	1	0	0	0	0	0	6
Massachusetts:											
Boston	3		8	8	49	59	0	6	0	188	244
Fall River	0		0	4	6	5	0	2	0	6	43
Springfield	0		0	59	0	5	0	1	0	21	41
Worcester	1		1	108	16	6	0	3	0	32	68
Rhode Island:											
Pawtucket	0		0	16	0	1	0	0	0	0	31
Providence	0		1	75	8	54	0	0	0	20	68
Connecticut:											
Bridgeport	0	45	5	81	4	15	0	0	0	2	62
Hartford	0	206	0	2	7	13	0	1	0	3	58
New Haven	0	90	2	1	9	3	0	0	0	5	64
New York:											
Buffalo	1	17	12	54	37	29	0	4	0	43	207
New York	35	208	28	56	203	257	0	83	2	72	1,680
Rochester	0	15	2	1	12	3	0	0	0	34	91
Syracuse	0			19		48	0		0	18	
New Jersey:											
Camden	1	5	0	0	7	12	0	2	0	3	37
Newark	0	22	3	189	25	7	0	5	0	23	125
Trenton	0	3	2	0	2	4	0	2	0	1	41
Pennsylvania:											
Philadelphia	10	131	22	8	66	168	0	36	0	125	656
Pittsburgh	6	68	28	7	45	37	0	11	0	30	278
Reading	0		2	2	2	15	0	0	0	43	27
Scranton	0			1		18	0		0	1	
Ohio:											
Cincinnati	8	21	11	22	24	25	0	8	0	18	173
Cleveland	4	323	11	5	38	74	0	17	0	58	259
Columbus	2	5	5	2	9	6	0	2	0	10	105
Toledo	2	6	3	2	11	15	0	3	0	26	80

City reports for week ended Jan. 30, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Anderson	0	------	0	2	3	4	0	1	0	0	10
Fort Wayne	1	------	1	0	8	3	0	0	0	0	36
Indianapolis	1	------	5	4	20	22	0	2	0	15	129
Muncie	0	15	0	0	3	5	0	0	0	1	7
South Bend	0	------	1	0	5	5	0	1	0	1	22
Terre Haute	13	------	0	0	0	4	0	0	0	0	31
Illinois:											
Alton	0	16	1	0	4	2	0	0	0	0	14
Chicago	8	55	14	9	46	198	0	43	0	95	707
Elgin	0	------	0	0	2	0	0	0	0	9	11
Moline	1	7	1	0	4	1	0	0	0	15	13
Springfield	1	------	0	0	5	4	0	0	0	15	21
Michigan:											
Detroit	11	15	13	5	42	307	0	18	1	82	339
Flint	1	------	0	17	5	19	0	2	0	0	20
Grand Rapids	0	15	2	9	2	11	0	0	0	26	38
Wisconsin:											
Kenosha	0	3	1	0	3	8	0	0	0	2	13
Madison	0	------	0	2	1	3	0	1	0	4	22
Milwaukee	0	7	8	1	6	48	0	6	0	32	116
Racine	0	1	1	2	0	6	0	0	0	0	16
Superior	0	------	3	0	0	6	0	0	0	12	17
Minnesota:											
Duluth	0	------	3	1	9	17	0	0	0	3	36
Minneapolis	1	------	7	1	21	7	0	2	0	6	122
St. Paul	0	9	9	4	13	10	3	3	0	46	79
Iowa:											
Cedar Rapids	0	------	--------	0	-------	2	0	-------	0	2	--------
Davenport	0	------	--------	0	-------	3	0	-------	0	0	--------
Des Moines	0	136	--------	0	-------	17	0	-------	0	0	58
Sioux City	0	------	--------	0	-------	14	3	-------	0	0	--------
Waterloo	0	------	--------	0	-------	8	0	-------	0	13	--------
Missouri:											
Kansas City	2	------	14	1	38	49	0	4	1	11	143
St. Joseph	0	59	0	0	7	7	50	0	0	0	22
St. Louis	10	------	5	1	34	51	4	4	0	48	297
North Dakota:											
Fargo	0	------	0	0	0	9	0	0	0	0	9
Grand Forks	0	------	--------	0	-------	0	1	-------	0	0	--------
Minot	0	------	--------	0	-------	1	0	-------	1	0	6
South Dakota:											
Aberdeen	0	------	--------	0	-------	2	0	-------	0	0	--------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	8
Nebraska:											
Omaha	0	------	6	0	13	5	0	0	0	6	65
Kansas:											
Lawrence	0	15	0	0	2	0	0	0	0	0	7
Topeka	------	------	--------	------	-------	------	------	-------	------	------	--------
Wichita	1	3	1	1	10	3	0	0	0	0	33
Delaware:											
Wilmington	1	------	0	57	7	1	0	2	0	0	37
Maryland:											
Baltimore	8	151	11	263	41	18	0	15	0	85	268
Cumberland	0	5	0	0	4	0	0	0	0	0	13
Frederick	0	1	0	0	1	0	0	0	0	0	5
District of Columbia:											
Washington	7	130	8	32	41	16	0	10	0	31	235
Virginia:											
Lynchburg	2	------	0	10	4	0	0	0	0	2	16
Norfolk	0	61	2	2	4	3	0	2	0	2	26
Richmond	1	------	4	4	6	6	0	1	0	0	58
Roanoke	1	------	0	36	2	1	0	0	0	6	22
West Virginia:											
Charleston	0	9	1	0	1	0	0	0	0	0	10
Wheeling	0	1	0	1	5	1	0	1	0	2	20
North Carolina:											
Gastonia	0	------	--------	0	-------	1	0	-------	0	0	--------
Raleigh	0	------	0	0	0	0	0	1	0	0	17
Wilmington	0	------	0	0	0	1	0	0	0	0	14
Winston-Salem	0	------	0	1	3	3	0	3	0	2	24
South Carolina:											
Charleston	1	231	0	6	5	2	0	2	0	0	27
Columbia	0	------	0	0	3	0	0	0	0	0	27
Greenville	0	------	0	0	0	1	0	0	0	0	3

City reports for week ended Jan. 30, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Georgia:											
Atlanta	2	302	8	0	9	6	0	5	0	0	83
Brunswick	2	1	1	0	1	0	0	0	0	0	5
Savannah	1	33	2	0	1	1	0	1	0	3	28
Florida:											
Miami	1	12	2	3	0	2	0	6	0	0	39
St. Petersburg											
Tampa	6	2	1	0	1	1	0	0	0	1	18
Kentucky:											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Covington	0	2	0	0	4	4	0	1	1	0	20
Lexington	0	15	0	2	2	0	0	2	0	0	25
Tennessee:											
Knoxville	2	104	8	0	10	2	0	0	0	0	37
Memphis	3	------	2	1	13	4	0	4	0	6	67
Nashville	2	------	1	0	11	4	0	2	0	0	69
Alabama:											
Birmingham	1	111	2	0	5	4	0	2	0	3	61
Mobile	0	7	0	0	4	2	0	3	0	0	20
Montgomery	0	------	------	0	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	1	0	------	0	0	------
Little Rock	0	28	0	0	11	1	0	1	0	0	14
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	0	0	1	5
New Orleans	6	132	6	0	28	2	0	11	0	1	178
Shreveport	0	------	1	0	13	0	0	1	1	0	57
Oklahoma:											
Muskogee	1	------	------	0	------	3	0	------	0	0	------
Oklahoma City	1	24	0	0	18	0	0	5	1	0	65
Tulsa	0	------	------	2	------	7	0	------	0	1	------
Texas:											
Dallas	7	11	7	6	13	8	0	3	1	1	71
Fort Worth	0	------	6	48	2	2	0	0	0	3	46
Galveston	0	------	0	0	2	1	0	1	0	0	21
Houston	2	------	2	0	8	3	0	5	0	2	83
San Antonio	2	------	9	3	11	0	0	10	0	1	99
Montana:											
Billings	0	------	0	0	3	0	0	0	0	0	15
Great Falls	0	------	6	0	3	0	0	0	0	0	12
Helena	0	------	0	2	4	7	0	0	0	0	9
Missoula	0	167	0	0	4	0	0	0	0	0	12
Idaho:											
Boise	0	------	0	1	5	1	0	0	0	0	13
Colorado:											
Colorado Springs	0	------	2	0	3	10	0	3	0	0	19
Denver	5	------	11	2	25	14	0	5	0	38	137
Pueblo	0	------	1	0	3	4	0	0	0	1	13
New Mexico:											
Albuquerque	0	------	0	0	3	2	0	3	0	0	11
Utah:											
Salt Lake City	0	------	5	23	7	6	0	2	0	6	57
Nevada:											
Reno	------	------	------	------	------	------	------	------	------	------	------
Washington:											
Seattle	1	261	12	6	23	4	0	1	0	5	114
Spokane	0	5	5	0	8	5	0	2	0	0	52
Tacoma	0	------	5	0	5	4	0	0	0	0	44
Oregon:											
Portland	0	488	18	0	18	2	0	1	0	1	146
Salem	0	160	------	0	------	1	0	------	0	0	------
California:											
Los Angeles	8	1,523	29	5	92	44	1	25	2	59	571
Sacramento	2	615	6	0	8	20	0	1	0	2	53
San Francisco	2	737	27	5	54	23	0	13	0	11	384

City reports for week ended Jan. 30, 1937—Continued

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:				Nebraska:			
Fall River	1	1	0	Omaha	1	0	0
Rhode Island:				Maryland:			
Providence	1	0	0	Baltimore	2	2	0
New York:				District of Columbia:			
Buffalo	0	1	0	Washington	2	1	0
New York	5	2	0	Virginia:			
Rochester	0	1	0	Norfolk	1	0	0
Pennsylvania:				North Carolina:			
Pittsburgh	2	0	0	Raleigh	1	1	0
Ohio:				South Carolina:			
Cincinnati	1	3	0	Greenville	1	0	0
Cleveland	2	1	0	Tennessee:			
Indiana:				Knoxville	2	1	0
Indianapolis	1	0	0	Louisiana:			
Illinois:				Shreveport	0	3	0
Chicago	1	2	0	Texas:			
Michigan:				Dallas	1	0	0
Detroit	1	2	1	Houston	1	0	0
Flint	0	0	1	San Antonio	1	0	0
Iowa:				Montana:			
Cedar Rapids	1	0	0	Billings	0	1	0
Missouri:				Colorado:			
Kansas City	1	2	0	Denver	1	0	0
St. Joseph	1	0	0	Washington:			
St. Louis	1	0	0	Spokane	1	1	0
South Dakota:				California:			
Aberdeen	0	0	1	Los Angeles	3	2	1

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Rochester, 1; Milwaukee, 1; Wichita, 1; Charleston, S. C., 1; San Francisco, 1.

Pellagra.—Cases: Boston, 1; St. Louis, 1; Charleston, S. C., 2; Brunswick, 1; Savannah, 1; Mobile, 1; New Orleans, 1; Los Angeles, 1.

Typhus fever.—Cases: Raleigh, 2: Montgomery, 2.

FOREIGN AND INSULAR

ITALY

Communicable diseases—4 weeks ended December 6, 1936.—During the 4 weeks ended December 6, 1936, cases of certain communicable diseases were reported in Italy as follows:

Disease	Nov. 9-15		Nov. 16-22		Nov. 23-29		Nov. 30-Dec. 6	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	22	22	20	19	24	23	16	16
Cerebrospinal meningitis	15	13	19	18	12	11	15	12
Chicken pox	271	121	483	172	474	172	539	172
Diphtheria and croup	646	332	620	335	683	374	644	333
Dysentery	11	11	7	6	7	7	11	6
Hookworm disease	14	4	6	4	14	6	4	4
Lethargic encephalitis	1	1	2	1	3	3	4	4
Measles	927	177	1,067	178	1,270	200	966	181
Mumps	230	66	331	87	332	84	453	91
Paratyphoid fever	52	43	57	42	34	28	46	39
Poliomyelitis	38	29	32	31	28	25	18	16
Puerperal fever	41	41	55	52	42	40	47	44
Scarlet fever	407	157	381	169	394	166	437	171
Typhoid fever	508	258	462	255	405	229	335	217
Undulant fever	32	26	44	37	45	35	26	23
Whooping cough	238	88	368	105	384	103	345	108

JAMAICA

Communicable diseases—4 weeks ended January 23, 1937.—During the 4 weeks ended January 23, 1937, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	8	Meningitis		1
Diphtheria	2		Scarlet fever	2	
Dysentery	4	7	Tuberculosis	22	69
Erysipelas		1	Typhoid fever	6	35
Leprosy		2			

NORWAY

Communicable diseases—1934.—The numbers of cases of and deaths from certain communicable diseases reported in Norway in 1934 are shown in the following table:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	25	12	Poliomyelitis	359	60
Diphtheria and croup	1,324	30	Scarlet fever	2,951	17
Dysentery	78	4	Typhoid and paratyphoid fever	124	21
Influenza	24,875	48	Whooping cough	6,367	45
Measles	9,470	61			

Vital statistics—1934.—The following table shows the number of births and deaths reported in Norway during 1934, together with death rates from certain diseases:

Births	41, 833
Birth rate per 1,000 population	14. 6
Deaths	28, 340
Death rate per 1,000 population	9. 9
Death rates per 100,000 population from—	
Apoplexy	85. 3
Arteriosclerosis	62. 3
Cancer	131. 4
Diabetes	9. 3
Nephritis	28. 1
Tuberculosis	112. 6

SWEDEN

Notifiable diseases—December 1936.—During the month of December 1936, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Poliomyelitis	[1] 125
Diphtheria	51	Scarlet fever	833
Dysentery	25	Typhoid fever	9
Epidemic encephalitis	6	Undulant fever	21
Paratyphoid fever	14	Weil's disease	1

[1] Includes 22 cases nonparalytic at time of notification.

SWITZERLAND

Communicable diseases—1936.—During the year 1936, cases of certain communicable diseases were reported in Switzerland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	30	Mumps	[1] 1,066
Chicken pox	[1] 2, 112	Paratyphoid fever	44
Diphtheria and croup	1, 099	Poliomyelitis	1, 269
Dysentery	1	Scarlet fever	[1] 2, 825
German measles	[1] 78	Trachoma	3
Influenza	[1] 2, 911	Tuberculosis	3, 726
Lethargic encephalitis	9	Typhoid fever	85
Measles	[1] 4, 084	Whooping cough	[1] 2, 694

[1] In addition epidemics of these diseases occurred, with incomplete reporting of cases.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for January 29, 1937, pages 143-155. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued February 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Siam.—Further information, dated January 20, 1937, regarding the epidemic of cholera in Siam states that there have been 389 cases with 233 deaths since January 1, 1937, making a total of 602 cases with 377 deaths officially reported since the beginning of the outbreak. In Bangkok, 36 new cases with 19 deaths were officially reported from January 1-20, 1937. It is stated that a large proportion of the foreign population have been inoculated and that the Government is conducting a vigorous campaign against the disease.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—Two rats found February 5, 1937, and one rat found February 6, 1937, in Paauhau Sector, Hamakua District, island of Hawaii, Hawaii Territory, have been found plague infected.

Northern Rhodesia.—An epizootic of plague with human cases was reported January 20, 1937, in Balovale and Mulobezi, Barotseland, Northern Rhodesia.

Peru.—During the month of December 1936 plague was reported in Peru, as follows: Lambayeque Department, 1 case; Libertad Department, 14 cases, 3 deaths; Lima Department, 1 case, 1 death.

Smallpox

Iraq.—During the week ended January 9, 1937, one case of smallpox was reported in Iraq.

Typhus fever

Eritrea—Asmara.—During the week ended January 16, 1937, 13 cases of typhus fever were reported in Asmara, Eritrea.

Yellow fever

Colombia—Barrancabermeja.—The American consul at Bogota, Colombia, under date of February 6, 1937, reports a case of yellow fever at Barrancabermeja, a port on the Magdalena River. It was stated that the disease was contracted in a village 30 kilometers distant and developed while the patient was visiting in Barrancabermeja. Representatives of the Rockfeller Foundation reported that *Stegomyia* (*Aëdes*) mosquitoes were found in 15 percent of the houses in the Colombian section of the town, which was said to be a normal percentage in that region. Antimosquito measures were being taken. The American section was said to be free from yellow fever bearing mosquitoes.

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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LACTOFLAVIN[1] IN THE TREATMENT OF CANINE BLACKTONGUE

By W. H. SEBRELL, D. J. HUNT, and R. H. ONSTOTT, *Passed Assistant Surgeons, United States Public Health Service*

Since it has been shown that the symptoms of vitamin G deficiency in rats are due to a deficiency in lactoflavin (riboflavin[1]) in the diet, there has been some question as to the identity of this substance with the pellagra- or blacktongue-preventive factor.

Rhoads and Miller (*1*), in 1935, reported that a blacktongue-producing diet maintained a normal rate of growth in young rats and stated that they were unable to produce blacktongue with a diet devoid of vitamin G. They inferred that blacktongue is due to some factor other than vitamin G. Birch, Gyorgy, and Harris (*2*), in 1935, presented evidence that the blacktongue-preventive factor was distinct from lactoflavin. Using two dogs, they showed that 30 gamma[2] of lactoflavin per day, given intraperitoneally, failed to cure a condition which they diagnosed as blacktongue. Their description does not agree with the symptoms of blacktongue as observed in this laboratory. They mention transverse ridges on the tongue as a prominent symptom. We have never seen such ridges in blacktongue. However, they present considerable other evidence which strongly supports the point of view that the human pellagra-preventive factor is distinct from lactoflavin and vitamin B_6. In addition, Dann (*3*) treated three cases of pellagra with lactoflavin without success. Spies (*4*) treated two cases without success, and Fouts, Lepkovsky, Helmer, and Jukes (*5*) treated two cases without success.

Booher and Hansmann (*6*), in 1936, using a lactoflavin concentrate obtained from a low lactose whey powder, which they state contains at least one other heat-stable vitamin necessary for rat growth, succeeded in preventing blacktongue in one dog for 138 days, and successfully treated two dogs which had what were apparently very mild early symptoms of blacktongue. Since they were dealing with an impure preparation, these authors point out that their experiments do not indicate whether only one or more than one of the heat-stable fac-

[1] Since Karrer and coworkers and Kuhn and coworkers have shown that lactoflavin is 6, 7, dimethyl 9 d-riboflavin we consider the term "riboflavin" preferable to lactoflavin.

[2] One gamma=0.001 mg.

tors of the vitamin B complex is involved in the prevention or cure of blacktongue. They state they found that lactoflavin alone would augment the growth of rats fed a canine blacktongue-producing diet.

Koehn and Elvehjem (*7*), in 1936, using flavin prepared from liver extract, given by mouth as a supplement to dogs on a blacktongue-producing diet in daily amounts equivalent to 5 grams of liver extract, failed to prevent the onset of symptoms of blacktongue in three dogs and in treatment failed to cure blacktongue in one dog, although no indication of the amount of the extract used in treatment is given. The three dogs in which its preventive action was tested were depleted before the supplement was started. Since these authors do not indicate definitely the quantities of flavin used, it appears that, in spite of this evidence against flavin having any blacktongue preventive action, the failure might be due to an insufficient amount of flavin, particularly since it has been found in testing the blacktongue-preventive value of foods that entirely different results can be obtained with varying amounts of the same food (*8*).

EXPERIMENTAL

Five dogs (Nos. 316, 318, 322, 329, and 336) were placed on our basic blacktongue producing diet No. 123, the composition of which is given in table 1. It has been our experience with this ration that, with few exceptions (these due apparently to coprophagy), it will produce blacktongue in dogs within about 60 days. These 5 dogs showed the first signs of blacktongue in 53, 36, 32, 61, and 67 days, respectively. Since the early symptoms of acute blacktongue frequently recede without treatment of any kind, in order to avoid this occurrence as far as possible the symptoms were allowed to progress until the attack was well developed. This stage was reached in 6, 2, 4, 5, and 6 days, respectively, from the first appearance of symptoms. (The symptoms and course of blacktongue as observed in these animals follow the description of the disease given by Goldberger and Wheeler (*9*).) Treatment was then started with large doses of a solution of riboflavin [3] given in gelatine capsules by mouth.

The significant details in regard to each of the experimental animals are as follows:

Dog No. 316

May 15, 1936: Begins diet 123 in good condition.

May 19: Weighs 7.7 kilos.

July 7: First signs of blacktongue—redness of mucosa of cheeks and injection of mucosa of floor of mouth.

July 9, 10, 11: No food eaten.

[3] The material used was a 0.05 percent solution furnished in sealed ampuls of 2 cc through the courtesy of Mr. John Hart, of the Winthrop Chemical Co., Inc., and was designated as L. F. No. 356. This material was diluted with distilled water and tested in daily doses equivalent to 10 gamma of riboflavin on rats with symptoms of riboflavin deficiency. There was a rapid gain in weight and disappearance of symptoms.

July 13: Red, bandlike lesion on the mucosa of each side of upper lip. Mucosa of cheeks and floor of mouth reddened. Margins of tongue reddened. Given 6 mg L. F. 356 by mouth.

July 14: Weighs 5.5 kilos. Given 4 mg L. F. 356 by mouth.

July 15: No food eaten since the 12th.

July 17: Symptoms of blacktongue have receded and mouth now shows only small red spot on the mucosa of the right side of the upper lip and reddened areas on the mucosa of each cheek.

July 18: Mouth appears normal.

July 21: Weighs 6 kilos.

July 23: Reddened patches have reappeared on mucosa of cheeks, and the mucosa of the floor of the mouth is streakily injected.

July 24: Reddened patches on mucosa of each side of upper lip. Mucosa of cheeks has red granular appearance. Mucosa of floor of mouth is very red.

July 26: Passed fresh blood by bowel.

July 27: Considerable bleeding by bowel. Died apparently from hemorrhage due to intestinal blacktongue lesion.

Summary.—Given 10 mg L. F. 356 in 2 days. One short recession of symptoms. Such recessions frequently occur in blacktongue with no treatment of any kind, and this one in all probability had nothing to do with the administration of riboflavin. Dead in 14 days from beginning of treatment.

Dog No. 318

May 15, 1936: Begins diet 123 in good condition.

May 19: Weighs 7.8 kilos.

June 16: Weighs 8.3 kilos.

June 20: First signs of blacktongue—a reddened streak on the mucosa of each side of the upper lip. The mucosa of the cheeks and of the floor of the mouth is very red.

June 22: Attack of blacktongue well developed with beginning pseudomembrane formation over reddened, bandlike lesion on mucosa of each side of upper lip and on mucosa of cheeks. Given 4 mg of L. F. no. 356.

June 23: Mouth lesions more extensive. Given 4 mg L. F. no. 356.

June 24: Condition is much worse. There is extensive pseudomembrane formation on mucosa of upper lip and cheeks. Mucosa of the floor of the mouth and the ventral surface of the tongue show superficial necrosis.

June 26: Moribund.

June 27: Found dead. No food eaten since June 20.

Summary.—Given a total of 8 mg of L. F. No. 356 in 2 days and died in 5 days from the beginning of treatment.

Dog No. 322

May 15, 1936: Began diet 123 in good condition.

May 19: Weighs 11.8 kilos.

June 16: Weighs 11.6 kilos. First signs of blacktongue—a streaky injection of the mucosa of the upper lip, floor of mouth, and cheeks.

June 20: Denuded, reddened areas on mucosa on each side of upper lip. Mucosa of cheeks has red denuded appearance. Mucosa of floor of mouth intensely reddened. Small superficially ulcerated areas on frenulum and ventral surface of tongue. Given 2 mg of L. F. 356.

June 21: Condition unimproved. Mucosa of upper lip and cheeks covered by pseudomembrane. Mucosa of floor of mouth continues intensely reddened. Given 4 mg L. F. 356.

June 22: Condition of mouth definitely worse, with deep ulcers on mucosa of each side of upper lip. Given 2 mg L. F. 356.

June 23: Condition appears to be hopeless. Moribund.

June 24: Found dead. No food eaten since June 18.

Summary.—Given 8 mg L. F. 356 in 3 days. Dead in 4 days from beginning of treatment.

Dog No. 329

May 15, 1936: Began diet 123 in good condition.

May 19: Weighs 7.4 kilos.

July 14: Weighs 7.8 kilos.

July 15: First signs of blacktongue—a diffuse reddening of the mucosa of cheeks, upper lip, and floor of mouth.

July 20: Symptons of blacktongue have steadily progressed and there is now a continuous red, bandlike lesion on the mucosa on each side of the upper lip with beginning pseudomembrane formation. Mucosa of cheeks has a red, granular appearance and is covered by thin pseudomembrane. Mucosa of floor of mouth is dusky red and there is a small ulcer near the frenulum of the tongue. Given 2 doses of 3 mg each of L. F. 356 by mouth.

July 21: Two doses of 3 mg each of L. F. 356 by mouth.

July 22: Given 4 mg L. F. 356 by mouth.

July 23: Has not eaten since July 15. Animal appears unimproved. Buccal mucosa red, and that of upper lip and cheeks still covered by pseudomembrane. Given 6 mg L. F. 356 by mouth.

July 27: Symptons of blacktongue have receded and there is now only a red streakiness of mucosa of upper lip and cheeks.

Aug. 12: Again shows red, bandlike lesion on mucosa of each side of upper lip, with redness of mucosa of floor of mouth and cheeks.

Aug. 15: Symptoms of blacktongue have again steadily progressed until entire mucosa of upper lip is fiery red and shows beginning pseudomembrane formation. Mucosa of cheeks covered by pseudomembrane. Mucosa of floor of mouth and of margin of tongue is very red. Given 2 doses of 3 mg each of L. F. 356 by mouth.

Aug. 16: Given 4 mg L. F. 356 by mouth.

Aug. 17: Given 2 doses of 3 mg each of L. F. 356 by mouth.

Aug. 18: Symptoms of blacktongue have steadily become worse and animal is now moribund.

Aug. 19: Dead.

Summary.—In spite of a total intake of 38 mg L. F. 356 the animal died of acute blacktongue in 30 days from the beginning of treatment.

Dog No. 336

May 15, 1936: Begins diet 123 in good condition.

May 19: Weighs 8 kilos.

July 21: Weighs 8.2 kilos. First signs of an attack of blacktongue—faint red streak on mucosa of each side of upper lip. Floor of mouth streakily injected.

July 27: Symptoms of blacktongue have steadily progressed and there is now an intensely reddened band on each side of the upper lip which is covered by pseudomembrane. Mucosa of cheek also reddened and covered by pseudomembrane. Given 4 mg L. F. 356 at 10 a. m. and 4 mg of L. F. 356 at 4 p. m., by mouth.

July 28: In comatose condition. Died during day. Necropsy shows lesions of advanced blacktongue and secondary bronchopneumonia.

Summary.—This animal died too soon after the administration of the riboflavin for the results to be of much significance.

SUMMARY

All five of the experimental animals died in 14, 5, 4, 30 days and 1 day from the beginning of treatment with riboflavin, having received a total dosage of 10 mg, 8 mg, 8 mg, 38 mg, and 8 mg, respectively.

CONCLUSIONS

Riboflavin in relatively large doses administered by mouth is without therapeutic value in acute blacktongue of dogs. This adds further evidence to the view that riboflavin is distinct from the blacktongue-preventive factor.

TABLE 1.—*Composition of basic blacktongue-producing diet no. 123* [1]

Article of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [3]	50	10.7	.7	30.4
Casein (purified) [4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked in a double boiler of enamelware for about 1¼ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and this finished mixture is served to the dog ad libitum.

[2] Whole maize meal (white) sifted as for human consumption.

[3] The variety known as the California black-eyed pea.

[4] Commercial casein leached for a week in daily changes of acidulated water.

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LEPROSY IN ARGENTINA

According to a report dated December 18, 1936, from the American Consul General at Buenos Aires, it is estimated that Argentina has between 8,000 and 15,000 lepers. It is stated that leprosy has been gradually increasing there for the past 30 years, while plans for its control, although made, have not been carried into effect.

Legislation passed in 1926 provides for—

1. Obligatory reporting of all cases known to medical authorities or to private citizens.
2. Medical assistance and supervision of all leprous cases under the direction of the National Department of Hygiene.
3. A census of the leper population to be regularly prepared and reported.
4. Isolation of all lepers in asylum-colonies to be constructed with funds derived from the tax on perfumes and patent medicines.

This law has, so far, not been made effective, largely because of the erroneous noticn on the part of citizens that the foundation of leper colonies would constitute a grave danger to the health of surrounding inhabitants; and as a result, bitter opposition was encountered whenever efforts were made to acquire sites for leper asylums.

An unofficial organization, the "Patronato de Leprosos" was formed in 1930, and, with such funds as it has been able to collect, has started a laboratory for the study of leprosy at the Muñiz Hospital in Buenos Aires, where about 200 lepers are interned. This organization is being constantly implored by lepers to provide them institutional care, but this is impossible because of lack of facilities, there being but about 400 beds available in the whole country. Many are sent to the federal capital from interior regions when there is no means of caring for them.

In commenting on the conditions President Justo said, on October 28, 1935:

> Public repulsion has prevented the concentrating of lepers in the adequate establishments recommended by modern science. The public is opposed to this measure because of the pretext of danger of infection. They erroneously suppose that establishments destined to shelter lepers constitute an imminent danger to the surrounding inhabitants, but this fear—paradoxical as it may seem—brings as a consequence the complete freedom of the sick persons and greatly facilitates and spreads infection; since the patient cannot go to a hospital or sanatorium—there being only one very small institution which admits them—they have no other recourse than to continue living in contact with the healthy population with the grave consequences which that implies. * * * This will soon be possible to avoid when the much-resisted leper colonies become a reality. The principal provisions of law no. 11,359 have not been fulfilled for lack of a way to carry them out. * * * Let us not permit the continuance in our country of this sad free circulation of lepers in constantly increasing numbers—and this illness no longer exists in the majority of nations—only because of prejudices brought about by the measures designed to solve the alarming problem. * * * The only

means of wiping out the scourge is the isolation of the patients. When this becomes possible through asylum-colonies, a work which the executive power will prosecute with all energy, and when national sentiment is so guided, we will be able to say that this easily avoidable disease has been wiped out.

The national hygiene department has plans for seven leper colonies distributed throughout the country in zones where leprosy is most prevalent.

According to Dr. Pedro L. Baliña, one of Argentina's leprologists, one of these colonies has been constructed on the Island of Cerrito on the Paraná River. It lacks only a part of its equipment to place it in operation, but political influences have prevented its opening, on the plea that it will become a national rather than a provincial asylum. Dr. Baliña states that there are but three places in the country that can offer lepers relief at present, the Muñiz Hospital, a general hospital in Buenos Aires, with a section devoted to leprosy having accommodations for 200 patients, the Carrasco Hospital in Rosario, with beds for 150, and a small asylum in the Province of Córdoba, able to care for 50 to 60 patients.

It is stated that funds for the construction of leper asylums and colonies are now available, and that in the near future the situation with regard to the control of leprosy and the care of lepers in Argentina should be completely changed.

RELIABILITY OF ESTIMATES OF RAT INFESTATION OF VESSELS BY INSPECTION

The determination by quarantine officers of whether or not a vessel shall be fumigated is based largely upon the presence (and degree of infestation) or absence of rats on board. Through international agreement, forms for deratization and deratization exemption certificates have come into use, and these forms, when properly and competently executed, are now almost universally accepted. The certificates provide space for recording the amount of rat infestation of the vessel; and it is the policy of the Public Health Service to require its quarantine officers to issue only completed certificates and to insist that those presented to them be completely filled in before acceptance. In order that the statements in the certificates regarding rat infestation be reliable, it is, of course, extremely important that the inspectors be competent and capable of making accurate estimates on the basis of inspection. It is especially important that the estimates be sufficiently accurate to differentiate between slight and moderate infestation.

As an indication of the degree of accuracy in estimating by inspection the amount of rat infestation of vessels that may be attained by competent and experienced inspectors, the following figures are pre-

sented, which are taken from the December report of the fumigation division of the United States Quarantine Station at Rosebank, Staten Island, N. Y.:

Total number of vessels inspected for rat infestation	215
Number of passenger vessels	21
Number of cargo vessels	180
Number of tankers	14
Estimated number of rats on inspection	318
Number of rats secured by fumigation	330

While 14 of these vessels were tankers and many of the others were of substantial ratproof construction, the figures give evidence of the high degree of skill in interpreting the signs of rat infestation that can be acquired by experience and practice.

MENTAL DEFECTIVES AND EPILEPTICS IN INSTITUTIONS IN THE UNITED STATES, 1935

The Bureau of the Census has recently issued a statement presenting a summary of the results of the 1935 census of mental defectives and epileptics in institutions primarily for these classes, from which the accompanying tables and statements are taken. The figures are preliminary and subject to possible correction.

Movement of patient population.—Table 1 shows, for 1935, the movement of the patient population in institutions for mental defectives and epileptics, that is, the number of patients at the beginning of the year, the number of admissions and of separations during the year, and the number present at the end of the year. Separate figures are given for State, city, and private institutions.

The figures presented in this table show that, in 1935, State institutions cared for a very large proportion of the total mental defectives and epileptics in special institutions for these classes. The fact that the proportion of the total patients on the books of State institutions at the beginning and at the end of the year, respectively, was so much larger than the proportion admitted to or leaving State institutions during the year indicates that, as a rule, the patients remained in State institutions much longer than in either city or private institutions. Probably incurables form a much larger proportion of the patients admitted to State institutions than of those admitted to city and private institutions.

Significance of the data.—These statistics are valuable chiefly in showing what provision has been made for the treatment of mental defectives and epileptics in special institutions, the types of mentally defective and epileptic persons being cared for, and the relative impor-

tance of the different types. It should be clearly recognized, however, that statistics relating to patients in institutions primarily for mental defectives and epileptics do not furnish even an approximate measure of the total number of such patients, either in the country as a whole or in the several States. The institutions established for the care of mental defectives and epileptics contain only a small part of the total number of such persons. The vast majority of them are not confined in institutions but live at large in the community. Many are inmates of prisons and reformatories, others are in almshouses, and some are in hospitals for mental patients.

TABLE 1.—*Movement of patient population in institutions for mental defectives and epileptics, by class of institution, 1935*

Class of patients	Number				Percent of total		
	Total	State institutions	City institutions	Private institutions	State institutions	City institutions	Private institutions
Patients on books at beginning of year	108,684	103,227	1,106	4,351	95.0	1.0	4.0
Male	56,674	53,851	592	2,231	95.0	1.0	3.9
Female	52,010	49,376	514	2,120	94.9	1.0	4.1
In institution	95,101	89,760	1,103	4,238	94.4	1.2	4.5
On parole or otherwise absent	13,583	13,467	3	113	99.1		.8
Admissions during year	13,152	12,067	425	660	91.8	3.2	5.0
Male	7,467	6,881	241	345	92.2	3.2	4.6
Female	5,685	5,186	184	315	91.2	3.2	5.5
First admissions [1]	11,243	10,299	349	595	91.6	3.1	5.3
Readmissions	887	765	76	46	86.2	8.6	5.2
Transfers from other institutions for mental defectives and epileptics	1,022	1,003		19	98.1		1.9
Separations during year	9,868	8,564	707	597	86.8	7.2	6.0
Male	5,586	4,873	402	311	87.2	7.2	5.6
Female	4,282	3,691	305	286	86.2	7.1	6.7
Discharges	5,539	4,911	185	443	88.7	3.3	8.0
Transfers to other institutions for mental defectives and epileptics	1,559	1,018	473	68	65.3	30.3	4.4
Deaths in institution	2,679	2,547	49	83	95.1	1.8	3.1
Deaths while on parole	91	88		3			
Patients on books at end of year	111,968	106,730	824	4,414	95.3	.7	3.9
Male	58,555	55,859	431	2,265	95.4	.7	3.9
Female	53,413	50,871	393	2,149	95.2	.7	4.0
In institution	97,439	92,329	821	4,289	94.8	.8	4.4
On parole or otherwise absent	14,529	14,401	3	125	99.1		.9

[1] The term "first admissions" is here used to designate persons admitted to institutions for mental defectives and epileptics for the first time. Of the 11,243 first admissions to such institutions during 1935, 10,299, or 91.6 percent, were admissions to State institutions. This figure does not agree with the total of the figures in tables 4 and 5 for the reason that they include 450 first admissions of patients who are neither mental defectives nor epileptics and, therefore, are not included in tables 4 and 5. Also, the 1,603 who are both mental defectives and epileptics are included in the totals of both of the latter tables.

Mental status.—According to the classification of mental defectives by mental status here used, an "idiot" is a mentally defective person having a mental age of not more than 35 months, or, if a child, an intelligence quotient of less than 25; an "imbecile" has a mental age of between 36 and 83 months, inclusive, or an intelligence quotient between 25 and 49; and a "moron" has a mental age of between 84 and 143 months, inclusive, or an intelligence quotient between 50 and 74.

As the mental defectives admitted to institutions consist largely of those who are unable to make adequate social adjustments, the proportions of idiots and of imbeciles among the first admissions of mental defectives are probably much higher than among the total mental defectives.

TABLE 4.—*First admissions of mental defectives to State institutions, by sex and mental status, 1935*

Mental status	Number			Percent distribution		
	Total	Male	Female	Total	Male	Female
Total	8,954	4,957	3,997	100.0	100.0	100.0
Moron	4,240	2,302	1,938	47.4	46.4	48.5
Imbecile	2,810	1,566	1,244	31.4	31.6	31.1
Idiot	1,645	936	709	18.4	18.9	17.7
Unclassified	259	153	106	2.9	3.1	2.7
Both mentally defective and epileptic	1,603	906	697	17.9	18.3	17.4

Type of epilepsy.—The classification of epilepsy as symptomatic and idiopathic is that of the American Psychiatric Association, "symptomatic" signifying cases in which the attacks result from a definite underlying disease and "idiopathic" signifying attacks resulting from unknown causes. It may be noted that epileptics of the idiopathic type far outnumbered those of the symptomatic type among first admissions to State institutions, and that a large majority of the first admissions were both epileptic and mentally defective.

TABLE 5.—*First admissions of epileptics to State institutions, by sex and type of epilepsy, 1935*

Type of epilepsy	Number			Percent distribution		
	Total	Male	Female	Total	Male	Female
Total	2,498	1,489	1,009	100.0	100.0	100.0
Symptomatic	682	436	246	27.3	29.3	24.4
Idiopathic	1,542	886	656	61.7	59.5	65.0
Unclassified	274	167	107	11.0	11.2	10.6
Both epileptic and mentally defective	1,603	906	697	64.2	60.8	69.1

DEATHS DURING WEEK ENDED FEB. 6, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 6, 1937	Corresponding week, 1936
Data from 85 large cities of the United States:		
Total deaths	10,319	10,682
Average for 3 prior years	9,040	
Total deaths, first 5 weeks of year	53,920	47,197
Deaths under 1 year of age	636	616
Average for 3 prior years	611	
Deaths under 1 year of age, first 5 weeks of year	3,229	2,823
Data from industrial insurance companies:		
Policies in force	69,123,600	67,857,697
Number of death claims	15,233	14,405
Death claims per 1,000 policies in force, annual rate	11.5	11.1
Death claims per 1,000 policies, first 5 weeks of year, annual rate	11.7	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 13, 1937, and Feb. 15, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 13, 1937, and Feb. 15, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936
New England States:								
Maine	4	1	499	5	28	324	0	0
New Hampshire			57	15	44	30	0	0
Vermont					1	271	1	0
Massachusetts	6	9			1,006	706	8	6
Rhode Island	1	1			179	58	0	0
Connecticut [1]	1		438	12	340	122	0	0
Middle Atlantic States:								
New York	34	87	[2] 50	[2] 69	288	1,807	12	20
New Jersey	13	10	54	17	464	70	3	5
Pennsylvania	44	48			145	640	14	9
East North Central States:								
Ohio	20	53	1,298	95	21	216	3	11
Indiana	5	36	172	45	4	9	4	3
Illinois	36	51	239	39	37	19	12	9
Michigan	13	4	24	8	58	27	4	1
Wisconsin	1	1	632	44	22	43	4	1
West North Central States:								
Minnesota	1	2	14	1	20	195	1	8
Iowa	6	7	90	4	2	14	1	12
Missouri	10	31	1,573	308	4	16	3	10
North Dakota	1	1	207	2		4	6	0
South Dakota		1	29		1	3	1	1
Nebraska	4	2	7		21	6	0	5
Kansas	5	15	698	47	6	15	2	0
South Atlantic States:								
Delaware	1		6		102	71	1	0
Maryland [3]	12	11	304	21	385	214	6	7
District of Columbia	6	18	53	3	32	21	0	4
Virginia	16	17			163	95	10	15
West Virginia	20	17	1,510	88	8	8	4	2
North Carolina [1]	24	12	115	234	61	23	4	2
South Carolina	8	2	1,135	1,588	32	13	0	10
Georgia [1]	12	11	827	649			1	3
Florida	5	4	5	18	4	3	10	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 13, 1937, and Feb. 15, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936
East South Central States:								
Kentucky	6	15	376	62	36	68	6	13
Tennessee	16	9	837	245	182	15	5	16
Alabama [1]	8	15	920	686	8	30	4	3
Mississippi [3]	4	3					1	2
West South Central States:								
Arkansas	5	9	1,048	57		2	15	2
Louisiana	7	25	228	48	1	40	0	3
Oklahoma [4]	4	8	1,342	207	15	3	3	17
Texas	51	69	3,624	370	330	93	9	8
Mountain States:								
Montana	7	2	403	18	7	56	2	0
Idaho			134	6	88	14	0	1
Wyoming						3	0	2
Colorado	1	4				8	0	6
New Mexico		6	406	8	29	1	0	0
Arizona	3		969	151	156	22	3	3
Utah [3]	1				24	4	0	1
Pacific States:								
Washington	2	1	11		61	174	3	1
Oregon	1		770	67	8	767	0	2
California	25	28	6,087	3,890	89	1,529	17	10
Total	450	596	27,281	9,077	4,512	7,872	178	234
First 6 weeks of year	3,547	4,164	167,901	24,794	26,130	36,334	857	1,115

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936
New England States:								
Maine	0	0	25	14	0	0	1	0
New Hampshire	0	0	13	8	0	0	0	0
Vermont	0	0	16	31	0	0	0	0
Massachusetts	1	0	235	290	0	0	0	5
Rhode Island	0	0	63	19	0	0	0	0
Connecticut [1]	0	0	97	67	0	0	1	0
Middle Atlantic States:								
New York	1	0	746	905	5	0	5	4
New Jersey	0	0	164	287	0	0	4	1
Pennsylvania	0	0	834	525	0	0	8	11
East North Central States:								
Ohio	1	1	313	473	1	1	3	2
Indiana	0	0	100	438	2	0	0	2
Illinois	0	1	622	668	11	14	3	3
Michigan	1	1	733	815	3	3	1	1
Wisconsin	0	0	361	454	2	25	0	1
West North Central States:								
Minnesota	0	0	136	361	8	4	0	1
Iowa	1	0	291	131	33	8	1	1
Missouri	0	1	288	186	98	4	2	12
North Dakota	0	0	73	74	57	1	1	0
South Dakota	1	0	69	54	6	12	0	0
Nebraska	0	0	108	184	5	20	1	1
Kansas	1	1	314	255	45	22	0	1
South Atlantic States:								
Delaware	0	0	2	6	0	0	0	1
Maryland [3]	0	0	49	90	0	0	0	1
District of Columbia	0	0	17	21	0	0	0	1
Virginia	0	0	31	43	1	0	4	6
West Virginia	0	0	49	35	0	0	1	2
North Carolina [1]	1	0	57	30	0	1	2	7
South Carolina	0	0	6	4	0	0	2	0
Georgia [1]	0	0	12	25	0	0	3	0
Florida	3	0	7	6	0	0	2	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 13, 1937, and Feb. 15, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936	Week ended Feb. 13, 1937	Week ended Feb. 15, 1936
East South Central States:								
Kentucky	1	4	24	54	0	0	8	3
Tennessee	1	0	27	43	0	0	6	0
Alabama [1]	1	1	16	19	5	0	1	1
Mississippi [3]	1	0	8	13	0	0	9	2
West South Central States:								
Arkansas	3	0	17	14	1	0	1	1
Louisiana	0	2	10	25	0	0	5	1
Oklahoma [4]	1	0	27	35	1	1	3	3
Texas	3	0	109	105	5	1	8	5
Mountain States:								
Montana	0	0	54	84	23	8	1	0
Idaho	0	1	0	59	3	10	0	1
Wyoming	0	0	12	119	4	4	0	0
Colorado	0	0	42	143	0	20	0	0
New Mexico	0	0	25	91	0	0	3	3
Arizona	0	1	28	24	0	0	0	0
Utah [3]	0	0	16	85	0	0	0	0
Pacific States:								
Washington	0	1	62	89	16	17	1	0
Oregon	0	1	20	48	11	0	2	1
California	0	9	274	395	25	1	4	3
Total	22	25	6,662	7,444	871	177	87	88
First 6 weeks of year	145	116	36,462	44,100	1,828	1,259	690	619

[1] Typhus fever, week ended Feb. 13, 1937, 9 cases, as follows: Connecticut, 1; North Carolina, 3; Georgia, 4; Alabama, 1.
[2] New York City only.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1936										
Arizona	8	27	428	1	227	1	1	56	0	9
Wyoming		1			3		0	44	6	3
January 1937										
District of Columbia	14	94	398		106		1	83	0	2
Missouri	16	123	6,711	4	36		3	1,137	355	20
Nebraska	6	2	322		13		2	284	27	4
New Mexico	3	13	1,360	1	103	1	2	107	0	18
South Carolina		153	3,460	530	144	70	1	39	0	10
West Virginia	20	55	2,597		84		4	269	0	13
Wyoming		7	340		3		0	72	23	6

Summary of monthly reports from States—Continued

December 1936

	Cases
Arizona:	
Chicken pox	191
Dysentery	13
Encephalitis, epidemic or lethargic	1
German measles	10
Mumps	38
Septic sore throat	1
Trachoma	15
Undulant fever	2
Whooping cough	19
Wyoming:	
Chicken pox	75
Encephalitis, epidemic or lethargic	2
Mumps	21
Septic sore throat	2
Whooping cough	10

January 1937

	Cases
Chicken pox:	
District of Columbia	145
Missouri	578
Nebraska	154
New Mexico	114
South Carolina	159
West Virginia	337
Wyoming	54
Conjunctivitis:	
New Mexico	1
Dengue:	
South Carolina	11

January 1937—Continued

	Cases
Diarrhea:	
South Carolina	221
Dysentery:	
Missouri (amoebic)	10
New Mexico (amoebic)	1
New Mexico (unspecified)	5
Encephalitis, epidemic or lethargic:	
Missouri	2
Nebraska	2
New Mexico	1
German measles:	
New Mexico	7
South Carolina	8
Hookworm disease:	
South Carolina	70
Mumps:	
Missouri	75
Nebraska	375
New Mexico	60
South Carolina	43
West Virginia	53
Wyoming	72
Ophthalmia neonatorum:	
New Mexico	1
South Carolina	10
Puerperal septicemia:	
New Mexico	1
Rabies in animals:	
Missouri	2
South Carolina	43
West Virginia	4

January 1937—Continued

	Cases
Rabies in man:	
West Virginia	2
Septic sore throat:	
Missouri	43
Nebraska	1
New Mexico	3
Wyoming	3
Tetanus:	
Missouri	1
South Carolina	1
Trachoma:	
Missouri	26
New Mexico	4
Tularaemia:	
Missouri	41
New Mexico	2
South Carolina	2
Typhus fever:	
South Carolina	8
Undulant fever:	
Missouri	1
West Virginia	1
Whooping cough:	
District of Columbia	112
Missouri	323
Nebraska	46
New Mexico	66
South Carolina	264
West Virginia	131
Wyoming	4

CASES OF VENEREAL DISEASES REPORTED FOR DECEMBER 1936

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	703	2.48	284	1.00
Arizona [1]				
Arkansas [2]	157	.79	108	.54
California	1,508	2.67	1,542	2.73
Colorado [1]				
Connecticut	197	1.15	131	.76
Delaware	188	7.34	47	1.84
District of Columbia	131	2.21	107	1.80
Florida	400	2.48	98	.61
Georgia	1,023	3.06	425	1.27
Idaho	14	.29	14	.29
Illinois	1,061	2.12	1,237	1.58
Indiana	125	.36	98	.29
Iowa [2]	122	.48	184	.73
Kansas	108	.58	60	.32
Kentucky [1]				
Louisiana	170	.80	97	.46
Maine [2]	85	.41	25	.30
Maryland	716	4.29	224	1.34
Massachusetts	444	1.01	590	1.35
Michigan	572	1.23	571	1.23
Minnesota	186	.71	310	1.18
Mississippi	1,878	7.03	2,706	10.59
Missouri	456	1.17	101	.26
Montana [3]	28	.53	54	1.02
Nebraska	45	.33	87	.64
Nevada [3]				
New Hampshire	15	.30	11	.22
New Jersey	673	1.57	276	.64
New Mexico	86	2.14	36	.93
New York	7,122	5.53	2,104	1.60

See footnotes at end of table.

Reports from States—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
North Carolina	1,210	3.54	389	1.14
North Dakota	10	.14	37	.53
Ohio	1,171	1.75	549	.82
Oklahoma [2]	258	1.03	99	.39
Oregon	78	.77	157	1.56
Pennsylvania [4]	236	.23	134	.13
Rhode Island	88	1.29	66	.97
South Carolina [2]	208	1.03	290	1.44
South Dakota	83	1.23	33	.49
Tennessee	410	1.41	222	.76
Texas	340	.56	202	.33
Utah [3]				
Vermont	20	.53	35	.93
Virginia	394	1.49	192	.73
Washington	296	1.81	323	1.98
West Virginia	230	1.27	89	.49
Wisconsin [5]	19	.07	101	.35
Wyoming [3]				
Total	23,314	1.90	13,815	1.13

Reports from cities of 200,000 population or over

Akron, Ohio	27	0.99	12	0.44
Atlanta, Ga.[3]				
Baltimore, Md.[1]				
Birmingham, Ala	120	4.25	72	2.55
Boston, Mass	172	2.18	223	2.82
Buffalo, N. Y	214	3.01	159	2.69
Chicago, Ill	786	2.20	627	1.76
Cincinnati, Ohio	91	1.95	55	1.18
Cleveland, Ohio	186	2.00	95	1.02
Columbus, Ohio	89	2.91	23	.75
Dallas, Tex	89	3.07	74	2.56
Dayton, Ohio [1]				
Denver, Colo	47	1.58	40	1.35
Detroit, Mich.[1]				
Houston, Tex.[6]	153	4.57	56	1.67
Indianapolis, Ind	21	.56	18	.48
Jersey City, N. J.[1]				
Kansas City, Mo	26	.62	4	.09
Los Angeles, Calif.[1]				
Louisville, Ky.[1]				
Memphis, Tenn	186	6.97	52	1.95
Milwaukee, Wis.[1]				
Minneapolis, Minn	71	1.46	124	2.55
Newark, N. J	196	4.23	97	2.09
New Orleans, La.[3]				
New York, N. Y	5,675	7.77	1,305	1.79
Oakland, Calif	45	1.48	42	1.39
Omaha, Nebr	12	.54	7	.32
Philadelphia, Pa	250	1.28	75	.38
Pittsburgh, Pa.[1]				
Portland, Oreg.[3]				
Providence, R. I	49	1.89	47	1.81
Rochester, N. Y	43	1.28	55	1.63
St. Louis, Mo	171	2.05	121	1.45
St. Paul, Minn	27	.96	29	1.03
San Antonio, Tex.[3]				
San Francisco, Calif	152	2.27	147	2.19
Seattle, Wash	144	3.79	184	4.85
Syracuse, N. Y	100	4.59	58	2.66
Toledo, Ohio	54	1.77	23	.76
Washington, D. C.[7]	131	2.64	107	2.15

[1] No report for current month.
[2] Incomplete.
[3] Not reporting.
[4] Includes only those cases that enter the clinics conducted by the State department of health.
[5] Only cases of syphilis in the infectious stage are reported.
[6] Reported by the Jefferson Davis Hospital; physicians are not required to report venereal diseases.
[7] Reported by the Social Hygiene Clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 6, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	9	1	0	5	3	0	0	0	5	28
New Hampshire:											
Concord	0	------	0	0	0	1	0	0	0	0	7
Manchester	0	------	0	0	1	4	0	0	0	0	13
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	0	------	1	0	0	0	0	1	0	3	8
Burlington	0	------	0	0	0	64	0	0	0	0	19
Rutland	0	------	0	1	1	0	0	0	0	0	3
Massachusetts:											
Boston	1	------	5	8	60	54	0	12	0	152	310
Fall River	0	------	2	8	6	3	0	0	0	0	44
Springfield	0	------	0	37	1	3	0	1	0	10	35
Worcester	0	------	0	100	13	2	0	3	0	23	63
Rhode Island:											
Pawtucket	0	------	0	7	0	1	0	0	0	3	25
Providence	1	4	2	174	8	37	0	4	0	19	73
Connecticut:											
Bridgeport	0	13	3	25	2	26	0	0	0	3	45
Hartford	------	------	------	------	------	------	------	------	------	------	------
New Haven	0	43	1	0	2	2	0	0	0	1	60
New York:											
Buffalo	1	7	6	46	26	21	0	9	0	33	175
New York	36	119	14	51	152	286	0	96	3	74	1,558
Rochester	0	------	1	1	17	6	0	1	0	15	89
Syracuse	0	------	1	25	11	53	0	1	0	32	72
New Jersey:											
Camden	0	3	3	0	5	14	0	0	0	2	32
Newark	0	18	0	297	14	9	0	4	0	29	110
Trenton	0	16	2	0	5	1	0	1	0	3	44
Pennsylvania:											
Philadelphia	8	87	24	10	71	199	0	35	1	104	605
Pittsburgh	1	43	25	8	44	41	0	8	0	49	263
Reading	0	------	5	2	1	12	0	1	0	25	36
Scranton	2	------	------	0	------	15	0	0	0	1	------
Ohio:											
Cincinnati	0	------	6	6	24	3	0	10	0	1	158
Cleveland	1	296	11	3	42	48	0	11	0	42	255
Columbus	7	6	6	2	11	7	0	5	0	20	112
Toledo	0	4	2	3	5	5	0	4	0	37	83
Indiana:											
Anderson	0	------	0	0	6	19	0	0	0	3	16
Fort Wayne	2	------	2	0	6	5	0	0	0	2	20
Indianapolis	2	------	1	2	28	29	0	8	0	19	133
Muncie	0	16	2	0	1	2	0	2	0	2	21
South Bend	0	------	1	0	8	3	0	1	0	1	30
Terre Haute	2	------	0	1	0	3	0	0	0	0	23
Illinois:											
Alton	0	------	1	0	4	6	0	1	0	1	16
Chicago	7	49	10	12	61	212	1	44	1	75	777
Elgin	0	------	0	0	1	0	0	0	0	10	9
Moline	0	------	0	0	4	0	0	0	0	13	15
Springfield	2	------	2	0	14	5	0	0	0	4	81
Michigan:											
Detroit	7	12	7	4	41	328	0	12	4	71	277
Flint	2	------	0	3	5	12	0	0	1	0	30
Grand Rapids	0	9	1	7	3	9	1	2	0	10	50
Wisconsin:											
Kenosha	0	7	0	0	0	1	0	1	0	1	7
Madison	0	------	0	2	1	5	0	2	0	8	20
Milwaukee	0	------	4	3	11	46	0	4	0	37	129
Racine	0	------	0	0	2	12	0	1	0	1	14
Superior	0	------	0	0	0	4	0	0	0	3	13
Minnesota:											
Duluth	0	------	0	0	6	14	0	3	0	0	22
Minneapolis	0	------	7	11	13	19	0	2	0	20	114
St. Paul	0	3	3	3	10	8	0	5	0	26	84

City reports for week ended Feb. 6, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids	0	------	------	0	------	2	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	2	18	------	0	------	24	0	------	0	0	33
Sioux City	0	------	------	0	------	20	0	------	0	1	------
Waterloo	0	------	------	0	------	24	0	------	0	7	------
Missouri:											
Kansas City	7	------	8	2	36	57	0	4	0	3	138
St. Joseph	0	------	0	1	6	3	34	0	0	0	32
St. Louis	10	9	4	1	25	55	0	5	0	49	267
North Dakota:											
Fargo	0	------	0	0	1	8	2	0	0	0	10
Grand Forks	0	------	------	0	------	0	2	------	0	0	------
Minot	0	------	0	0	0	0	0	1	0	0	5
South Dakota:											
Aberdeen	0	------	------	0	------	2	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	8
Nebraska:											
Omaha	0	------	1	0	9	10	0	3	0	1	69
Kansas:											
Lawrence	0	6	1	0	2	0	0	0	0	0	8
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	18	1	0	9	8	1	0	0	2	38
Delaware:											
Wilmington	0	------	0	55	5	0	0	1	0	0	27
Maryland:											
Baltimore	3	79	8	267	44	13	0	9	1	86	274
Cumberland	0	1	0	0	2	0	0	0	0	1	10
Frederick	0	------	1	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	14	42	7	32	40	13	0	14	0	16	231
Virginia:											
Lynchburg	0	------	0	1	1	1	0	0	0	1	18
Norfolk	0	------	2	0	6	2	0	1	0	0	57
Richmond	1	------	2	0	11	7	0	4	0	1	62
Roanoke	1	------	0	60	1	1	0	0	0	0	22
West Virginia:											
Charleston	1	5	2	0	14	0	0	1	0	0	37
Wheeling	0	4	0	0	1	2	0	3	0	0	26
North Carolina:											
Gastonia	0	------	0	0	0	0	0	0	0	0	------
Raleigh	0	------	0	0	0	0	0	0	0	0	12
Wilmington	0	------	0	0	1	0	0	0	0	6	8
Winston-Salem	0	4	0	1	4	1	0	0	0	1	19
South Carolina:											
Charleston	0	451	0	1	7	3	0	1	2	0	21
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	0	0	0	1	0	0	0	0	7
Greenville	0	------	0	0	1	1	0	0	0	0	10
Georgia:											
Atlanta	3	378	9	0	13	10	0	2	1	0	97
Brunswick	0	------	0	0	0	0	0	0	0	0	3
Savannah	1	72	1	0	2	0	0	4	0	5	36
Florida:											
Miami	1	1	0	0	3	1	0	4	0	0	34
Tampa	4	1	0	0	0	1	0	0	0	0	18
Kentucky:											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Covington	1	11	0	0	3	2	0	0	0	0	18
Lexington	0	15	0	2	5	0	0	1	0	2	19
Tennessee:											
Knoxville	5	63	4	0	6	0	0	2	0	3	45
Memphis	1	------	9	1	11	6	0	9	1	10	112
Nashville	1	------	3	0	15	1	0	1	0	0	66
Alabama:											
Birmingham	0	135	9	0	7	1	0	4	0	10	68
Mobile	3	2	1	0	1	1	0	0	0	0	15
Montgomery	1	4	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	3	0	------	0	1	------
Little Rock	0	11	0	0	6	1	0	4	0	0	11
Louisiana:											
Lake Charles	1	2	0	0	2	1	0	1	1	0	10
New Orleans	8	74	15	0	19	3	0	15	3	0	175
Shreveport	0	------	2	3	16	0	0	2	0	0	60

City reports for week ended Feb. 6, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Muskogee	0			0		2	0		0	0	
Oklahoma City	1	30	1	0	11	8	0	0	0	0	62
Texas:											
Dallas	4	71	2	7	14	10	0	5	0	2	77
Fort Worth	2		9	47	11	1	2	8	0	2	52
Galveston	0		0	0	6	1	0	3	0	0	18
Houston	5		2	0	17	1	1	7	0	4	117
San Antonio	8	8	7	4	18	1	0	12	0	0	101
Montana:											
Billings	0		1	0	1	0	0	0	0	0	11
Great Falls	0		5	0	10	2	0	0	0	0	21
Helena	0	148	0	12	3	6	0	0	0	0	7
Missoula	0	56	0	0	1	0	0	0	0	0	4
Idaho:											
Boise	0		0	0	3	3	0	0	0	0	12
Colorado:											
Colorado Springs	0		1	0	2	5	0	1	1	0	14
Denver	3		6	2	9	12	0	6	0	42	97
Pueblo	1		1	0	4	5	0	0	0	0	13
New Mexico:											
Albuquerque	1		0	0	3	5	0	5	0	0	19
Utah:											
Salt Lake City	1		5	14	4	14	0	2	0	8	47
Nevada:											
Reno											
Washington:											
Seattle	0		6	3	19	6	0	2	0	8	134
Spokane	0	4	4	0	7	2	0	0	0	9	35
Tacoma	1		6	0	7	1	0	0	0	0	43
Oregon:											
Portland	1	97	15	0	19	2	4	4	0	0	132
Salem	0	56		0		0	0		0	0	
California:											
Los Angeles	8	933	20	23	76	34	1	20	0	65	443
Sacramento	4	688	7	0	21	20	0	3	0	1	67
San Francisco	1	497	17	1	33	22	0	18	0	25	275

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	0	1	0
New York:			
New York	9	4	1
Rochester	2	0	0
New Jersey:			
Newark	2	1	0
Pennsylvania:			
Pittsburgh	3	4	0
Ohio:			
Cincinnati	1	0	0
Cleveland	1	1	0
Indiana:			
Anderson	1	1	0
Indianapolis	1	0	0
Terre Haute	1	0	0
Illinois:			
Chicago	4	1	0
Springfield	1	0	0
Michigan:			
Detroit	2	1	0
Missouri:			
Kansas City	1	0	0
St. Joseph	0	1	0
St. Louis	5	0	0
Maryland:			
Baltimore	3	1	0
District of Columbia:			
Washington	6	1	0
West Virginia:			
Charleston	1	1	0
Georgia:			
Atlanta	1	0	0
Louisiana:			
Lake Charles	1	0	0
Texas:			
Houston	3	1	0
San Antonio	0	1	0
Colorado:			
Denver	1	1	0
Washington:			
Seattle	1	0	0
Oregon:			
Portland	0	0	1
California:			
Los Angeles	2	2	0
Sacramento	1	0	0
San Francisco	0	1	0

Dengue.—Deaths: San Antonio, 1.
Encephalitis, epidemic or lethargic.—Cases: New York, 2; Alton, 1.
Pellagra.—Cases: Baltimore, 1; Charleston, S. C., 4; Savannah, 4; Montgomery, 2.
Typhus fever.—Cases: New York, 1; Wilmington, N. C., 1; Charleston, S. C., 1; Mobile, 1.

FOREIGN AND INSULAR

BERMUDA

Vital statistics—1936.—The following table shows the number of births and deaths reported in Bermuda during 1936:

Population (census of 1931) [1]:	
White	11, 353
Colored	16, 436
Live births:	
White	216
Colored	532
Stillbirths:	
White	11
Colored	17
Deaths	330

[1] It was stated that, at the present time, the ratio of colored to white population is approximately 2 to 1.

In 1935 there were recorded 727 live births and 304 deaths.

CANADA

Provinces—Communicable diseases—Week ended January 16, 1937.—During the week ended January 16, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			1		3					4
Chicken pox		6	5	171	519	48	78	27	95	949
Diphtheria		3	5	29	20	2	1	2	2	64
Dysentery				1	5				3	9
Erysipelas				10	5	8	1	4		28
Influenza		10			148	1	209		68	436
Lethargic encephalitis					1					1
Measles		4	9	354	275	38	575	105	1, 297	2, 657
Mumps			9		372	5	20	12	103	521
Paratyphoid fever								1		1
Pneumonia	2	5			28		8		9	52
Poliomyelitis						4			1	5
Scarlet fever		11	17	67	169	55	29	92	38	478
Tuberculosis	1	16	5	42	66	1		1	13	145
Typhoid fever			2	8	1	1	2	3		17
Undulant fever				6	1					7
Whooping cough		31		124	162	5	25	18	21	386

LATVIA

Notifiable diseases—October–December 1936.—During the months of October, November, and December 1936, cases of certain notifiable diseases were reported in Latvia as follows:

Disease	October	November	December	Disease	October	November	December
Botulism	1		2	Poliomyelitis	4	2	2
Cerebrospinal meningitis	8	3	10	Puerperal septicemia	4	5	10
Diphtheria	80	107	68	Scarlet fever	267	332	330
Erysipelas	43	41	60	Tetanus	1		
Influenza	189	793	2,656	Trachoma	40	79	41
Leprosy	1	1		Tuberculosis	262	248	288
Measles		4	6	Typhoid fever	54	41	25
Mumps	4	6	8	Whooping cough	34	58	53
Paratyphoid fever	17	6	6				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936				December 1936				January 1937				
						7	14	21	28	5	12	19	26	2	9	16	23	30
Afghanistan	C				P													
Ceylon: Batticaloa	C				3													
India	C	17,917	25,973	19,883	20,423	4,664	5,068	6,347	6,938	7,196	6,303	2,856						
	D	8,500	12,681	9,785	9,520	2,339	2,663	3,194	3,551	3,742	3,335	1,570						
Assam	C	151	293	289	368	174	176	187	173	178	209		277	343	102	57	44	39
	D	75	180	158	184	88	82	79	69	87	85		143	191	67	30	19	23
Bassein	C	1	1															
Bombay Presidency	C	1,923	3,597	2,970	4,281	465	289	523	1,082	1,131	701	484	321	283	83	76		
	D	795	1,500	1,378	1,575	254	142	226	498	589	409	284	185	151	54	43		
Bombay	C	[1] 1		[2] 1	[1] 1					1	1							
Calcutta	C	154	103	54	73	14	13	19	15	19	18	15	9	17	11	18	23	19
Central Provinces and Berar	C	1,349	5,730	4,363	4,239	333	228	182	179	107	155	113	192	52	69	3		1
Chittagong	C	5	3	6	2		1		15	8			3	2				1
Madras Presidency	C	3,654	5,478	4,607	6,271	2,033	2,479	3,103	2,589	2,331				405	951	953		
	D	1,621	2,587	2,336	3,143	1,065	1,150	1,589	1,357	1,168				196	497	386		
Madras	C	6		8	21	6	6	17	28	41	19			21	21	11	14	8
	D	1	1	1	6	1	1	5	5	14	7			8	10	6	9	8
Negapatam	C	15	24	9									17	4	11	4	1	2
	D	7	10	5									7	4	7	1		1
Northwest Frontier Province	C						2	5	77	4	1		2					
Orissa Province	C								155	170	329	307	188	183	208	192	130	176
Punjab	C	418	652	169	18			7										
Rangoon	C	3	3		4	1	1	1	1	2						1		
Sind State	C		20	38														
Tuticorin	C	29					5	4	3	3								
India (French):																		
Chandernagor Territory	C	8																
Karikal Province	C	117	98	25	69		4			11	38	20						
Pondichery Province	C	1	1	4		2	2		6									
Indochina (see also table below): Cochinchina—Vinlong	C											1						
Siam:																		
Bangkok	C	22	1										2	9	14	31	62	75
Provinces	C	66	117	57	18					12	44	59	90	92	105	138	159	170
On vessels: S. S. *Chakdina* at Calcutta from Chittagong	C	1																

[1] Imported.

[2] Suspected.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		August 1936			September 1936			October 1936			November 1936			December 1936	
		1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indochina (French) (see also table above):															
Cambodia [2]	C				2	2								1	
	D				2	1								1	
Cochinchina [2]	C				1			1				1			1
	D				1			1				1			1

Place		June 2–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936				December 1936				January 1937				
						7	14	21	28	5	12	19	26	2	9	16	23	30
Algeria:																		
Algiers	C										[2] 1							
Plague-infected rats					2													
Oran Department	C		[2] 2	[2] 2														
Philippeville	C		[2] 1															
Argentina. (See table below.)																		
Belgian Congo	C				[2] 2													
Brazil (see also table below):																		
Santos	C		4															
	D		1															
Sao Paulo.[3]																		
British East Africa:																		
Kenya	C	13	25	14	16	4	3	6	5	4	1	3			10			
Uganda	C	96	97	87	81	18	21	23	23	15	19	14	4	4	6			
	D	93	91	78	79	15	16	22	23	15	18	13	4	4	6			

Ceylon:																		
Colombo	C	3	1	1	3		2	2		1			2	1			1	
	D	3		1	1		2	1		1			2	1			1	
Plague-infected rats		2	1	1	7		1			1			3				3	
Maskiliya	C	1																
Southern Province	C		1															
China: Manchuria.[4]																		
Dutch East Indies: West Java	C	318	410	382	391													
	D	317	408	374	391													
Ecuador:																		
Alausi	C			1														
Babahoyo	C							5				2		1	2			
Plague-infected rats								6										
Bajada del Morro	C				3		4											
Guayaquil	C		4	2	5	1	6	9	5	5	2	6		2	5		3	7
	D		1	3	1	2	5	2	5	2	2	9		1	4		2	4
Plague-infected rats		5	4	6	4	2	1	4		3	1	4					4	6
Playas	C										7	4		1				
Egypt:																		
Alexandria: Plague-infected rats		P	P	P	P		P											
Asyut Province	C			4	[5] 3	1							2	1	1			
Beheira Province	C				1													
Girga Province	C				1		1											
France: Marseille [6]	C		1	2														
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District: [7]																		
Hamakua Mill Sector					2													
Kukaiau														1				
Paauhau Sector [7]		3	6	22	12	1			2	1	3	1		2	1			6
Maui Island—Wailuku District—Keahua Region					1													
India	C	294	900	1,172	2,292	478	438	615	804	725	623	905						
	D	186	531	430	684	143	189	171	214	200	240	344						
Bassein	C	9	5						1	1					1	1	1	
Plague-infected rats			1	1	1													
Bombay Presidency	C	3	10	72	109	11	15	26	5			42	39	27	43	29		
	D	2	6	45	66	5	10	16	4			21	15	26	26	18		
Calcutta	C	[2] 1																
Central Provinces and Berar	C	9	147	528	1,445	317	167	368	524	440	322	426	404	456	817	270	193	286
Madras Presidency	C	41	154	63	48	10	19				11	17		3	9	3		
	D	24	86	55	25	3	12				1	8			2	3		
Rangoon	C	2	3		1									1		2		
Plague-infected rats		1	4	3														
Indochina (see also table below):																		
Bentre	C													1				
Pnom-Penh	C		4															

[1] Including plague in the United States and its possessions.

[2] Suspected.

[3] A report dated July 29, 1936, states that 23 cases of pneumonic plague with 18 deaths were reported in Sao Paulo, Brazil.

[4] A report dated Aug. 20, 1936, states that 5 cases of plague were reported at Kirin Province, Manchuria, China.

[5] Includes 1 case of pneumonic plague.

[6] A report dated Sept. 3, 1936, states that 2 plague-infected rats were reported in Marseille, France.

[7] Plague-infected rats have been reported in Hawaii Territory, Hawaii Island, Hamakua District, as follows: Locality not specified, week ended Aug. 8, 2 plague-infected rats; Paauhau Sector, week ended Feb. 6, 1937, 2 plague-infected rats; week ended February 13, 1937, 2 plague-infected rats; week ended Feb. 20, 1937, 1 plague-infected rat.

CHOLERA, PLAGUE, SMALLPOX, TYPUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936: 7	14	21	28	December 1936: 5	12	19	26	January 1937: 2	9	16	23	30
Iraq: Baghdad Province	C				1													
Madagascar. (See table below.)																		
Malta	C		4	3	[7] 3	1	3	1	1						2	2		2
	D		1												1			
Northern Rhodesia.[8]																		
Peru. (See table below.)																		
Senegal. (See table below.)																		
Tunisia: Tunis	C		2		5		1						1					
Plague-infected rats		1	2										3	1				
Union of South Africa (see also table below)	C	[9] 1	4	6	3	[9] 3				[9] 5				[9] 2				
United States:																		
California:																		
Eldorado County—Plague-infected chipmunk					1													
Lassen County—Plague-infected squirrels		1																
Modoc County [10]—Plague-infected squirrels		4	10															
Monterey County.[10]																		
Placer County [10]	C	1																
San Bernardino County.[10]																		
Santa Cruz County [10]—Plague-infected squirrels		11																
Montana: Beaverhead County.[11]																		
Utah:																		
Beaver County	C	1																
Plague-infected marmots			2															
Plague-infected squirrels		1																
Garfield County [12]—Plague-infected prairie dogs			2															
Sevier County.[12]																		
On vessels:																		
S. S. *Ipanema* at Marseille from Bone and Philippeville	C		1															
S. S. *Delambre* at Liverpool from Montevideo, Buenos Aires, Rosario, Santos, and Las Palmas—Plague-infected rats				2														

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Argentina:							
Buenos Aires—							
Plague-infected rats					4		
Catamarca Province	C				1		
Cordoba Province	C					4	5
Salta Province	C	4					
San Luis Province	C						1
Santiago del Estero Province	C			[9] 2			
Tucuman Province	C	1		[13] 6			
Brazil (see also table above):							
Bahia State	C		[14] 46				
Ceara State	C		[14] 106				
Pernambuco State	C		[14] 45				
Piauhy State	C		[14] 4				
Indochina (see also table above):							
Cambodia	C	4	8				1
Cochinchina	C	6	1				1
Madagascar (central region)	C	26	83	104	160	186	
	D	26	81	95	154	174	

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Peru	C	4	6	8	16	33	16
Cajamarca Department	C					9	
Lambayeque Department	C			3	1	3	1
Libertad Department	C	3	1	1	6	19	14
Lima Department	C	1	2	2	9	2	1
Callao: Plague-infected rats			P	P			
Piura Department	C		3	2			
Senegal:							
Dakar [15]	C	1					
	D	1					
Tivaouane [15]	C	8	4				
Union of South Africa (see also table above)	C			21	11	5	

[6] Suspected.
[7] Includes 1 case of pneumonic plague.
[8] During the week ended Jan. 23, 1937, an epizootic of plague with human cases was reported in Northern Rhodesia.
[9] For 2 weeks.
[10] Plague-infected fleas have been reported in California as follows: Week ended June 27, 1936, 3 lots in Modoc County, and 7 lots in Santa Cruz County: Aug. 18–21, 104 plague-infected fleas collected from ground squirrels in San Bernardino County, and according to information dated Nov. 10, 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley, also in San Bernardino County, have been proved positive for plague. A report dated Oct. 13, 1936, states that fleas taken from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague-infected.
[11] During the week ended July 25, 1936, 153 fleas and 26 lice taken from 7 marmots (ground hogs) shot at the head of Small Horn Canyon, Beaverhead County, Mont., were reported plague-infected.
[12] Plague-infected fleas in Utah have also been reported as follows: Aug. 24, 45 fleas taken from 23 prairie dogs in Garfield County, and July 28, 1936, 315 fleas taken from 11 ground squirrels in Clear Creek Canyon, Sevier County.
[13] Pneumonic plague.
[14] From Jan. to Aug. 31.
[15] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936: 7	14	21	28	December 1936: 5	12	19	26	January 1937: 2	9	16	23	30
Algeria:																		
Constantine Department	C	1																
Oran Department	C	2																
Philippeville	C		1															
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia	C	2	43	99	99	19	6	7	6									
Porto Alegre (alastrim)	D		2	1	4					1								
Recife (alastrim)	C				3	1		2		2		12	1					
British East Africa: Tanganyika	C	100	94	74	453			3	204	4				151				
British Somaliland	C		2															
Canada:																		
Alberta	C		[1]1				[1]1		[1]3		[1]4						2	
Saskatchewan	C	[1]2	[1]1															
Ceylon: Colombo	C		1		1													
China (see also table below):																		
Amoy	C	3																
Canton	C									1	1							
Dairen	C	2	2															
Foochow	C	P	P	P			P						P					
Hangchow	C	1		1														
Hankow	C									2	2							
Hong Kong	C	2		1												2	4	1
Nanking	C	5			1	1				1	1	1						
Shanghai	C	14	9		7	3	1	4	16	14	19	42	23		38	57	51	53
Tientsin	C	1			2	1				2	1	1						
Chosen. (See table below.)																		
Colombia	C		126	[2]76	84													
Barranquilla	D		6	1	1	3					5	2		1		3		
Dutch East Indies: Surabaya	C																	[3]1
Ecuador: Guayaquil	C		1	1	3		[1]3	5						6	1		1	2
Egypt: Alexandria	C						[3]1											
Eritrea. (See table below.)																		
Ethiopia	C						13											

Finland	C	6	8															
France. (See table below.)																		
Gambia (Upper)	C	28																
Gold Coast	C	[4] 12																
Great Britain: England and Wales—																		
Lancaster—Failsworth	C															2		
London and Great Towns (Oldham)	C								1	2	5							
Greece: Salonika	C	13			40	10	8	8	8	8	10	10	10	10				
Guatemala. (See table below.)																		
India	C	10, 011	5, 419	3, 413	2, 388	818	848	880	1, 013	1, 300	1, 558	985						
	D	2, 955	1, 478	886	582	200	208	220	238	304	385	264						
Assam	C	54	79	70	64	4	4	16	12	20	37		35	20	47	64	44	37
Bombay Presidency	C	647	510	258	183	10	26	38	42	53		43	35	34	57	102		
	D	128	100	46	41	3	9	6	9	6		4	11	15	9	13		
Bombay	C	46	39	17	11		1	1	1	1	2	2	2	4	3	2	10	6
	D	28	28	14	6		1	1	1			2	1	5	1	3	4	4
Calcutta	C	46	45	6	12	2		4	2	3	3	1	2	3	4	5	8	9
	D	38	39	8	7			1	1	2	1	3	1	1	2	3	4	2
Central Provinces and Berar	C	477	187	70	46	9	2	9	18	19	38	11	47	6	36	21	89	83
Chittagong	D	11			3				[3] 2	2	6		2	48	46	38	48	57
Cochin	C			2														
Karachi	C	2				[3] 1							3	2	10	11	9	8
Madras Presidency	C	752	1, 122	442	470	92	56	77	73	69				3	46	61		
	D	160	205	96	96	14	7	27	11	11				2	6	11		
Madras	C		2	3	1			2	1	6	1						1	2
Moulmein	C	18	10	12	3	2	1	4	5	13	1	8	9		12	13	10	13
Northwest Frontier Province	C	15	7	22	14	4	5	4	2	13	13		21	20	11	35	24	35
Orissa Province	C									49	121	75	131	130	146	187	81	137
Punjab	C	113	52	65	77	86	86	36	86	59		73	188	117	111	109	101	
Rangoon	C	1	5	1	10	2	4	4	1		1		[3] 1	2	[3] 1	1		[3] 1
Sind State	C	54	31	51	21	2			50	35	60		42	9	55	42	60	29
Vizagapatam	C		2		1													
India (French): Pondichery Province	C	6	1															
	D	2																
India (Portuguese)	C				7													
Indochina (see also table below): Pnom-Penh	C	1	1	7	4	2	1	1	1		1							
Iran	C	1	6	9	2		1				1				1			
Teheran	C	1	3	4	4			1	1		1							
Iraq	C		1		3		3	3			30				1			
Baghdad	C		1															
Japan:																		
Osaka	C	2	11	21	16													
Tokyo	C								1									
Mexico (see also table below):																		
Durango	D									1				1			1	
Guadalajara	D	3	2	1														
Mexico, D. F.	C	7	7		1		2			1			1	1				
Monterrey	C																2	
Torreon	C	3		3	13	1		1				2	1	8	1	1	10	11

[1] For 2 weeks. [2] For 3 weeks. [3] Imported. [4] For 4 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936: 7	14	21	28	December 1936: 5	12	19	26	January 1937: 2	9	16	23	30
Morocco. (See table below.)																		
Nigeria	C	[4] 512	34		98			12		[1] 11								
Lagos	C		1	1	1													
Northern Rhodesia	C					76	15											
Peru. (See table below.)																		
Portugal (see also table below):																		
Lisbon	C	2	2	1												2		
Oporto	C		1	1														
Sierra Leone	C	9	3	[1] 38	28	[1] 3		[1] 13		[1] 20								
Freetown	C										3							
Southern Rhodesia	C				P						10							
Sudan (Anglo-Egyptian)	C	1	13	105	96			56	57	71	11	26	8	17	15			5
Tunisia	C			1											1			
Turkey. (See table below.)																		
Union of South Africa	C	1	P															
Uruguay. (See table below.)																		

On vessels:
S. S. *Talamba* at Rangoon from Calcutta .... 1 case ...... Aug. 11, 1936
S. S. *Colorado Springs* at Manila from Shanghai .... 1 case ...... Feb. 1, 1937

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Angola	C		143	153			
Argentina:							
Chaco Territory	C		1				
Corrientes Province	C		6	3	1		
Entre Rios Province	C				154	18	
Jujuy Province	C	6	1				
Los Andes Territory	C				12		
Salta Province	C				31		2
Santa Fe Province	C			2			
Belgian Congo	C	98	88	105	110	25	

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Mexico (see also table above):							
Chihuahua State—Chihuahua	C		1	1			
Colima State	C			1			
Jalisco State—Guadalajara	C		3	3			
	D		1	1			
Mexico State	C				1		
Mexico, D. F.	C	12	5	1	6		
Mexico City	D			1	1		
Puebla State—Puebla	C			2			

Bolivia	C	29	12					Queretaro State	C	1					
Chosen	C	21	10	3	2			Sonora State	C				1		
Eritrea	C			2			1	Morocco	C	3	2	1			2
France	C	36	2		1	10		Peru	C	7	74	23	24		
Guatemala	C	5	13	1	1	1	4	Portugal (see also table above)	C		43	83	82	126	
Indochina (see also table above)	C	93	119	87	39	159	219		D		3	4	7	5	
	D	8	21	8	12	33	38	Turkey	C	16					
								Uruguay	C			1			

TYPHUS FEVER

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936					November 1936				December 1936				January 1937		
					3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16
Algeria:																				
Algiers Department	C	73	24					2	1				4	1		[1] 3	13	3	9	
Algiers	C	1	1				1				1		3				1			
Constantine Department	C	44	42	1	1	1			8	6	4	11	15	20		[1] 48	30		19	
Bone	C												1							
Constantine	C	2	2	1						1	1		1			[1] 3				
Philippeville	C															1				
Oran Department	C	1	2				1											2		
Australia: Sydney	C										1									
Basutoland	C	5		7																
Bolivia. (See table below.)																				
Bulgaria	C		1																	
Ceylon: Colombo	C					1														
Chile	C		508	543			[2] 333	131	113	105	157									
Santiago	C		[1] 87	83			[2] 152													
Valparaiso	C	3	3	1	1	1		3	1				12	14	3	3	1	2		2
China:																				
Dairen	C					1	1			1										
Hankow	C	1																		
Nanking	C	1																		
Shanghai	C			2				2												
Tientsin	C	6	1			1														
Tsingtao	C	1	2																	
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				

[1] For 2 weeks.

[2] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19	26	January 1937: 2	9	16
Egypt:																				
Alexandria	C	2	2			2											1	1		
Aswan Province	C			1																
Asyut Province	C	2	4						1											
Beheira Province	C	8	1															1	7	
Cairo	C	3	1		1	1	2			1										
Dakahliya Province	C	1																		
Faiyum Province	C	1														1		1		
Gharbiya Province	C	5	3						2							3			5	
Girga Province	C	1	2												2					
Minufiya Province	C	1	2															1		
Port Said	C															1	1	3	2	
Sharkiya Province	C	7	4															1		
Suez	C		1																	
Provinces	C	135	30	5	2	3	1	1	5	3	3	3	6		2	4	8	6	13	25
Eritrea: Asmara	C																			13
Finland. (See table below.)																				
France. (See table below.)																				
Greece (see also table below): Salonika	C	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	3	3	7	4	2	4		2		2	5		1		1		2	1	2
Hungary	C			1																
Iran	C	8	4	11			3				1		1		3	1				
Teheran	C	1		2																
Iraq: Baghdad	C																			1
Irish Free State:																				
Galway County:																				
Bothar Buidhe	C	1																		
Oughterard	C	2																		
Kerry County—Dingle	C		2	3		2														
Italy: Catania	C										1									
Mexico (see also table below):																				
Durango	D		1																	
Mexico, D. F.	C	14	20	23		4	2	6	4		4	2	1	2	1		1	6	4	
Saltillo	D						1													
San Luis Potosi	D	1										1			1			1	1	
Torreon	C	1		1				2												

Morocco (see also table below)	C	6	1													1		1	2	1
Palestine:																				
Haifa	C	6	13	16		3	2	2	3	2	3		2	3	2	3	3		1	
Jaffa	C	5	13	23	4	3	3	2		6	1				4	4		1		1
Paraguay: Asuncion	D		3	1																
Peru. (See table below.)																				
Poland	C	136	49	47	16	9	13	6	19	15	34	46	36	53	40	49	33	49	58	77
	D	11		3						1	1	1	3	5	2	2	4	4	6	2
Portugal. (See table below.)																				
Rumania. (See table below.)																				
Sierra Leone: Freetown	C									1										
Spain: Catalonia	C	1																		
Straits Settlements: Singapore	C	3		3														1		
Sudan (Anglo-Egyptian)	C															8				
Tunisia:																				
Tunis	C	2	1	2			1		1			3						1	2	2
Provinces	C	40	21	19	7	12	3	5		6	2	23	12		48	6		[1] 54	41	73
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Bolivia	C	47	29				
China: Manchuria—Harbin	C	15	3	4		1	
Chosen	C	80	20	24	24	30	
Czechoslovakia	C	4	1	1			
Finland	C		1	1			
France	C					1	1
Greece (see also table above)	C	3	10	9	11	11	
Guatemala	C	30	30	38	17	33	28
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C		3	1	2		
Chihuahua State	C			1			
Durango State	D		1				
Guanajuato State	C		7				
Jalisco State: Guadalajara	C	1	1	1			
Mexico State	C	3	10	4	18		
	D	2	2		1		
Mexico, D. F.	C	23	19	21	14		
Mexico City	C						
	D			8	7		5

Place		July 1936	August 1936	September 1936	October 1936	November 1936	December 1936
Mexico—Continued.							
Oaxaca State	C		4	2	2		
Puebla State: Puebla	C		10	6	2		
Queretaro State	C		1	1	3		
San Luis Potosi State: San Luis Potosi	C	3	4	1	1		
Sinaloa State	D	1					
Morocco (see also table above)	C	6	2			1	2
Peru	C	268	67	48	80		
Portugal	C		1	2			
Rumania	C	168	32	25	60	178	
Turkey	C	39	15	27	21	18	21
Istanbul	C	2	1	1	3	4	1
Union of South Africa:							
Cape Province	C	58	113	43	75	74	
Natal	C				7	19	
Orange Free State	C	2	15	14	43	9	
Transvaal	C			1	4	11	
Yugoslavia	C	53	16	6		7	49

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		June 28–July 25, 1936	July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Week ended— October 1936: 3	10	17	24	31	November 1936: 7	14	21	28	December 1936: 5	12	19	26	January 1937: 2	9	16	23
Belgian Congo.[1]																					
Brazil: Matto Grosso State	C														1			2			
Colombia [2]	C															3					
	D		3	3												1					
Barrancabermeja.[3]																					
Cundinamarca Department	D	2	1																		
Intendencia of Meta—																					
Acacias	D										1										
Quenane	C							1													
Restrepo [2]	D	2	2	1				1	1												
Villavicencio [2]	D			1				2													
Santander Department [2]	D	2	4	1																	
Dahomey	C	[3] 1		2							1										
French Guinea—Macenta	C			[4] 2		1															
Gold Coast:																					
Accra [5]	C																				4
Tamale	C															1					
Teshi	C																				1
Nigeria:																					
Aba	C			[3] 1																	
Calabar	C										1										
Ilorin Province	D			[3] 1																	
Kano	C		[3] 1																		
Maiduguri	D									1											
Uyo	C																1				
Senegal:																					
Bambey	C											1									
Khombole	C								1	1											
M'Bour	C												[3] 1								
Thies	C								1				[3] 1								
Tivaouane	C			1																	
Sierra Leone	C			[3] 1			1														
Freetown [6]																					

Sudan (French):																					
Katibougou	C					1															
Kayes	C	[3] 1																			
Koulikoro	C			1		2															
Segou	C								1												

[1] Information dated Jan. 23, 1937, states that the suspected fatal case of yellow fever reported Dec. 22, 1936, at Mangembo, Belgian Congo (p. 123 of PUBLIC HEALTH REPORTS of Jan. 22, 1937) has not been confirmed.

[2] Yellow fever has also been reported in Colombia, as follows: Restrepo, June 4 to July 30, 7 deaths; Villavicencio, January, June, and July, 6 deaths; Santander Department, June and July, 6 deaths; week ended Feb. 6, 1937, 1 case in Barrancabermeja, a port on the Magdalena River.

[3] Suspected.

[4] Includes 1 suspected case.

[5] During the week ended Jan. 30, 1937, 1 case of yellow fever was reported at Accra, Gold Coast.

[6] Information dated Jan. 7, 1937, states that the suspected case of yellow fever reported Nov. 16, 1936, at Freetown, Sierra Leone (pp. 1731 and 1815 of PUBLIC HEALTH REPORTS) has not been confirmed by the protection test.

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PUBLIC HEALTH REPORTS

VOL. 52 MARCH 5, 1937 No. 10

AGE OF GAINFUL WORKERS OF THE UNITED STATES, 1920 AND 1930 [1]

Studies on the Age of Gainful Workers No. 1

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INTRODUCTION

During the past quarter century increasing interest has been manifested in problems involving the age of the gainful worker. More recently questions have arisen that demand for their study the age of the gainful worker specific for occupation. Such questions include, among others, those dealing with child and woman labor, old-age dependency and pensions, occupational morbidity and mortality, unemployment, unemployment insurance, and workmen's compensation for nonaccidental and accidental injuries.

The term *gainful worker* includes, according to the Bureau of the Census (*1*), "* * * all persons 10 years old and over who usually follow a gainful occupation even though they may not have been actually employed at the time the census was taken. It does not include women doing housework in their own homes without wages and having no other employment, nor children working at home, merely on general household work, on chores, or at odd times on other work."

With the aid of basic data contained in published volumes of the Bureau of the Census, it is purposed in this introductory paper to investigate the age composition of gainful male and female workers in 9 important groups of occupations for the years 1920 and 1930. In the present inquiry the data for the white and colored workers are combined. It is planned in subsequent papers to study for the same census years the age composition of male and female workers in different geographic regions, the age composition of white and Negro workers by sex, and the age composition of male and female workers in specific occupations of two or three occupational groups. Studies such as these are essentially introductory to similar ones of the future and obviously necessary for a better understanding of the facts that will be disclosed by them.

[1] From the Office of Industrial Hygiene and Sanitation, U. S. Public Health Service, Washington, D. C.

TABLE 1.—*Gainful workers in the United States, 10 years of age and over, in different occupational groups, 1920 and 1930*

Occupational group	Both sexes 1920	Both sexes 1930	Males 1920	Males 1930	Females 1920	Females 1930
	Number					
All groups	41,614,248	48,829,920	33,064,737	38,077,804	8,549,511	10,752,116
Agriculture, forestry, animal husbandry	10,953,158	10,722,467	9,869,030	9,812,199	1,084,128	910,268
Extraction of minerals	1,090,223	984,323	1,087,359	983,564	2,864	759
Manufacturing and mechanical industries	12,818,524	14,110,652	10,888,183	12,224,345	1,930,341	1,886,307
Transportation and communication	3,063,582	3,843,147	2,850,528	3,561,943	213,054	281,204
Trade	4,242,979	6,081,467	3,575,187	5,118,787	667,792	962,680
Public service (n. e. c.)[1]	770,460	856,205	748,666	838,622	21,794	17,583
Professional service	2,143,889	3,253,884	1,127,391	1,727,650	1,016,498	1,526,234
Domestic and personal service	3,404,892	4,952,451	1,217,968	1,772,200	2,186,924	3,180,251
Clerical occupations	3,126,541	4,025,324	1,700,425	2,038,494	1,426,116	1,986,830
	Percent					
All groups	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, animal husbandry	26.3	22.0	29.9	25.8	12.7	8.5
Extraction of minerals	2.6	2.0	3.3	2.6	(2)	(2)
Manufacturing and mechanical industries	30.8	28.9	32.9	32.1	22.6	17.5
Transportation and communication	7.4	7.9	8.6	9.4	2.5	2.6
Trade	10.2	12.5	10.8	13.4	7.8	8.9
Public service (n. e. c.)[1]	1.8	1.7	2.3	2.2	.2	.2
Professional service	5.2	6.7	3.4	4.5	11.9	14.2
Domestic and personal service	8.2	10.1	3.7	4.7	25.6	29.6
Clerical occupations	7.5	8.2	5.1	5.3	16.7	18.5

[1] N. e. c.=Not elsewhere classified.
[2] Less than 0.1 of 1 percent.

GAINFUL WORKERS IN DIFFERENT OCCUPATIONAL GROUPS

Table 1 shows the gainful workers of both sexes distributed among 9 important groups of occupations for 1920 and 1930, respectively. It will be observed that, when sex is disregarded, the order of the groups of occupations with respect to the percentage of workers in each group remains unchanged with the passage of 10 years. There is a sensible decrease, however, in the percentage of persons in agriculture, forestry, and animal husbandry, and an increase in trade, and domestic and personal service. The orders of the occupational groups for males and females, respectively, are different from each other and different from the order shown for both sexes. For the males, the order is the same at the beginning and end of the decade, while for the females the corresponding orders are different from each other. The orders for the males for 1920 and 1930, respectively, differ from the order for both sexes in that the transportation and communication group and the domestic and personal service group replace each other. The orders for the females at the beginning and end of the

decade are remarkably different, only 4 of the 9 occupational groups being undisturbed. Domestic and personal service ranks first at the beginning and end of the decade; clerical occupations rank second in 1930, replacing the occupations of manufacturing and mechanical industries. In each sex group there is a perceptible decrease in agriculture, forestry and animal husbandry, and for the males a larger increase in trade than for the females. With respect to the female group, the following changes that occurred during the decade are worthy of noting: In addition to the decrease in agriculture, forestry and animal husbandry, already referred to, there was a decrease in the percentage of females engaged in the manufacturing and mechanical industries, and an increase in both the professional and the domestic and personal services groups.

GAINFUL WORKERS IN DIFFERENT OCCUPATIONAL GROUPS BY AGE

The sex-age distribution of the gainful workers of 1920 and 1930, according to all occupational groups and for particular groups, respectively, is shown in table 2. Regardless of occupation it is observed that the order of importance of the different age groups is by no means the same for the males and females of the same year nor for the males and females, respectively, of different years. In fact, only the age group 25 to 44 years has the same rank when the percentages for the various ages, specific for sex and year, are arranged in decreasing order of magnitude, and this particular age group ranks first. More precisely, in 1920 almost one-half of the male workers and approximately 40 percent of the female workers, respectively, were between the ages of 25 and 45 years. In 1930 the same age group was represented by practically the same percentage of male workers, and by a slightly higher percentage of females.

With respect, further, to the gainful workers in all occupational groups, the table shows that for the males the second highest percentage represented the middle-aged group, 45 to 64 years, the percentage being about the same for both 1920 and 1930, namely, 26 percent. For the females, on the other hand, the middle-aged group ranked third in both years, with 16 percent in 1920 and 18 percent higher in 1930. Of equal interest is the proportion yielded by the age group 10 to 17 years. In 1920 this child group, both male and female, ranked fourth, the percentage for females (11 percent), however, being twice that for the males. In 1930 this ratio remained unchanged, but the male child group dropped to last (6th) place, with less than 4 percent, while the corresponding female group moved to fifth place, with 7 percent. It is of interest to observe that the male child group of 1920, holding at that time fourth place, was supplanted at the end of 10 years by the age group 65 and over, the percentages in both instances being the same (5 percent); the place of the female

TABLE 2.—*Sex-age distribution of gainful workers, by occupational group, 1920 and 1930*

Occupational group	1920							1930						
	Age group							Age group						
	10 years old and over [1]	10–17	18–19	20–24	25–44	45–64	65 and over	10 years old and over [1]	10–17	18–19	20–24	25–44	45–64	65 and over
	Number	Percent						Number	Percent					
	Both sexes							Both sexes						
All groups	41,541,526	6.676	5.407	14.276	45.730	23.843	4.068	48,785,489	4.399	5.211	14.650	45.758	25.462	4.520
Agriculture, forestry, animal husbandry	10,942,669	10.283	4.835	11.564	39.325	27.446	6.547	10,717,037	9.172	5.659	12.161	35.917	29.245	7.846
Extraction of minerals	1,086,715	4.633	4.999	13.290	53.243	21.767	2.063	983,728	1.992	4.144	13.249	51.538	26.581	2.496
Manufacturing and mechanical industries	12,795,029	6.040	5.391	13.900	48.391	23.107	3.171	14,097,429	3.307	4.992	13.858	48.294	25.871	3.678
Transportation and communication	3,055,920	3.511	5.244	15.545	51.283	21.892	2.525	3,839,399	1.955	4.133	15.045	52.952	23.303	2.612
Trade	4,236,212	4.675	4.059	12.072	49.353	26.255	3.586	6,076,084	3.094	4.011	12.024	49.782	27.012	4.077
Public service (n. e. c.)[2]	767,640	1.571	6.714	15.354	41.502	28.621	6.238	855,486	.555	2.472	10.213	45.722	32.921	8.117
Professional service	2,138,948	.967	4.079	18.956	51.267	21.478	3.253	3,249,414	.859	3.341	18.737	50.828	22.749	3.486
Domestic and personal service	3,395,378	4.905	4.467	12.221	46.419	27.281	4.707	4,944,804	4.233	5.365	13.653	45.079	26.958	4.712
Clerical occupations	3,123,015	10.260	11.220	26.172	40.805	10.298	1.245	4,022,078	4.281	9.791	26.858	45.486	12.161	1.423
	Males							Males						
All groups	33,007,662	5.507	4.374	12.486	47.200	25.910	4.523	38,046,775	3.746	4.205	12.615	46.724	27.615	5.095
Agriculture, forestry, animal husbandry	9,859,639	8.679	4.641	11.508	40.226	28.231	6.715	9,807,239	7.989	5.491	12.139	36.578	29.786	8.017
Extraction of minerals	1,083,860	4.609	4.984	13.278	53.279	21.787	2.063	982,971	1.984	4.137	13.244	51.551	26.588	2.496
Manufacturing and mechanical industries	10,867,341	4.330	4.375	12.844	50.255	24.712	3.484	12,212,971	2.204	3.964	12.748	49.681	27.449	3.954
Transportation and communication	2,843,088	2.694	4.231	14.222	52.897	23.261	2.695	3,558,429	1.607	3.299	13.736	53.968	24.610	2.780
Trade	3,569,586	3.610	2.920	10.434	50.399	28.589	4.048	5,114,555	2.700	3.102	10.734	50.595	28.335	4.534
Public service (n. e. c.)[2]	745,904	1.598	6.836	15.408	41.090	28.711	6.357	837,938	.559	2.512	10.241	45.598	32.877	8.213
Professional service	1,125,366	.689	1.581	9.475	53.821	29.225	5.209	1,725,906	1.081	1.963	10.962	52.265	28.524	5.205
Domestic and personal service	1,214,279	3.333	2.713	9.282	49.710	29.470	5.492	1,769,629	2.490	3.455	10.949	47.847	29.392	5.867
Clerical occupations	1,698,599	10.355	7.696	19.777	44.498	15.559	2.115	2,037,137	4.436	7.087	20.393	47.923	17.620	2.541

	Females							Females						
All groups	8, 533, 864	11. 200	9. 401	21. 199	40. 045	15. 848	2. 307	10, 738, 714	6. 711	8. 776	21. 861	42. 339	17. 834	2. 479
Agriculture, forestry, animal husbandry	1, 083, 030	24. 884	6. 602	12. 076	31. 124	20. 205	5. 019	909, 828	21. 918	7. 470	12. 403	28. 787	23. 408	6. 014
Extraction of minerals	2, 855	15. 762	10. 473	17. 863	39. 404	14. 186	2. 312	757	12. 021	12. 549	19. 419	35. 403	18. 098	2. 510
Manufacturing and mechanical industries	1, 927, 688	15. 682	11. 119	19. 856	37. 882	14. 061	1. 400	1, 884, 458	10. 458	11. 657	21. 051	39. 303	15. 643	1. 888
Transportation and communication	212, 832	14. 420	18. 778	33. 220	29. 726	3. 599	. 257	280, 970	6. 358	14. 696	31. 625	40. 073	6. 755	. 493
Trade	666, 626	10. 377	10. 162	20. 839	43. 751	13. 760	1. 111	961, 529	5. 188	8. 847	18. 888	45. 454	19. 978	1. 645
Public service (n. e. c.)[2]	21, 736	. 639	2. 517	13. 475	55. 659	25. 552	2. 167	17, 548	. 383	. 547	8. 901	51. 624	35. 001	3. 539
Professional service	1, 013, 582	1. 276	6. 852	29. 482	48. 432	12. 875	1. 053	1, 523, 508	. 603	4. 902	27. 545	49. 199	16. 207	1. 539
Domestic and personal service	2, 181, 099	5. 780	5. 444	13. 857	44. 587	23. 062	4. 270	3, 175, 175	5. 201	6. 430	15. 160	43. 536	25. 602	4. 068
Clerical occupations	1, 424, 416	10. 147	15. 421	33. 797	36. 402	4. 025	. 203	1, 984, 941	4. 122	12. 567	33. 493	42. 984	6. 558	. 276

[1] Excludes a negligible number of unknown age.
[2] N. e. c.=Not elsewhere classified.

child group of 1920, on the other hand, was taken 10 years later by the females of 18 to 19 years of age, and the females of 65 and over were in the last place in both years with approximately equal percentages (2 percent).

The following pertinent questions now arise: Given a particular age group, specific for sex, how do the different occupational groups rank with respect to the proportion of their workers in this age group, and are there any changes in order with the passage of time? The questions are asked primarily with regard to the child, middle-, and old-aged groups, respectively; that is, the age groups, 10–17, 45–64, and 65 and over.

Further reference to table 2 is necessary for a study of the questions proposed. The male child group of 1920 engaged in clerical occupations was 10 percent of the total number of males so employed. No other occupational group furnished a corresponding percentage so large. The female child group for the same year showed approximately the same percentage, which was, however, lower than the corresponding percentages yielded by 5 other occupational groups; the highest percentage (25 percent) was associated with agriculture, forestry, and animal husbandry. The year 1930 showed similar decreases for both males and females in the child group of the clerically employed. In both instances the decrease was from 10 percent in 1920 to approximately 4 percent in 1930. In the latter year the male child group clerically engaged was superseded only by agriculture, forestry, and animal husbandry (8 percent); with regard to the female child group, while those engaged in agriculture, forestry, and animal husbandry decreased to 22 percent, the rank of this group of occupations remained unchanged. It will be observed that the number of males and females in the clerical occupations increased during the 10 years, but their proportions, respectively, in the child group were in 1930 less than one-half of the corresponding proportions in 1920. With respect to the boys, all occupational groups, professional service and public service excepted, showed decreases in their proportions at the end of the 10 years. The proportions for the girls, while on a higher level at the beginning of the decade (public service excepted) than those for the boys, were all lower at the end of the decade than at its beginning.

The year 1920 showed the clerically employed males to have 16 percent of their number in the middle-aged group. No other occupational group furnished a corresponding percentage so low; the highest percentages were yielded by domestic and personal service (29.5 percent) and professional service (29.2 percent). The middle-aged female group of clerical workers for the same year was 4 percent of the total females clerically employed, the percentage, as in the instance of the males, being practically the lowest among all occupational groups; the highest percentages were associated with domestic and personal

service (26 percent) and public service (25.5 percent). With the passage of 10 years the percentages for the males and females, respectively, in clerical occupations, while increasing by approximately 2 percent, remained the lowest among all occupational groups. For the males the largest increase, from 22 to 27 percent, was associated with the extraction of minerals. There were slight decreases for trade, professional service, and domestic and personal service. The remaining occupational groups showed slight increases. For the middle-aged females the largest increases are shown for trade, 14 to 20 percent, and for public service, 25.5 to 35 percent. As in the instance of the males there was a slight decrease for domestic and personal service. The remaining occupational groups showed slight increases.

With respect to the age group 65 and over all occupational groups, with the possible exception of females in domestic and personal service, showed slightly higher proportions at the end of the decade than at its beginning. In 1920 extraction of minerals ranked first (7 percent) among the males, public service ranking second (6 percent); in 1930 these two occupational groups interchanged places with proportions that amounted to 8 and 8.2 percent, respectively. Among the females, agriculture, forestry, and animal husbandry ranked first (5 percent) in 1920 with domestic and personal service second (4 percent); in 1930 this order remained unchanged.

RATIO OF OBSERVED PERCENTAGE OF GAINFUL WORKERS IN EACH OCCUPATIONAL GROUP TO EXPECTED PERCENTAGE

It is desirable and, at the same time, illuminating to compare the observed percentages constituting the percentage age distribution of gainful workers, specific for sex, occupational group, and census year, with defined "expected" or "normal" percentages. The percentages of all gainful workers distributed among the various age groups, regardless of occupation but specific for sex and census year, may be assumed to be expected or normal percentages for each occupational group specific for sex and census year. The ratio of an observed percentage to its corresponding expected percentage will disclose whether there is a relatively large, a relatively small, or a normal percentage of workers of a particular occupational group in a specific sex-age group and census year. The expected percentages as defined together with those observed are given in table 2.

Reference to the expected percentages has already been made in the previous section. In table 3 the calculated ratios are shown, and figures 1 and 2, respectively, present the ratios graphically for males and females. The dashed line in each figure drawn through 1.00 indicates the normal or expected level of gainful workers; when the expected percentage of persons in a particular age and occupational group is the same as the percentage of persons actually observed in

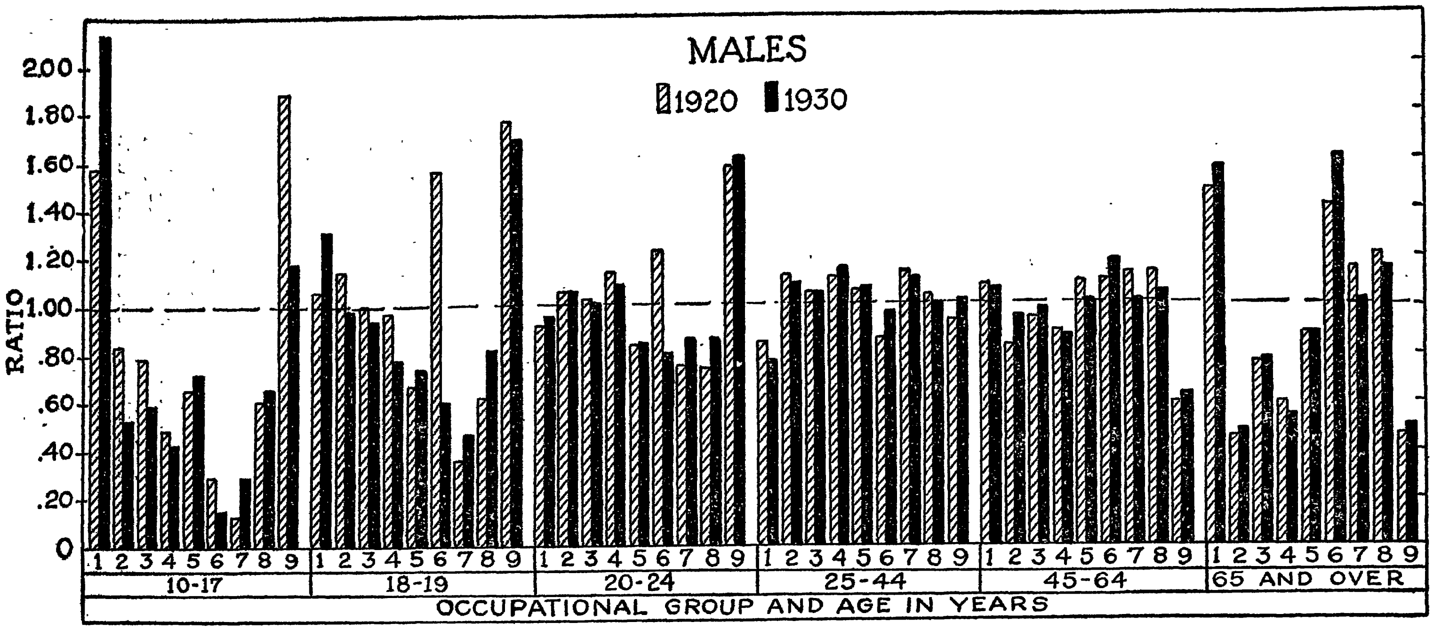

FIGURE 1.—Age-specific ratios of the percentages of gainful male workers in different occupational groups to the percentages for all groups, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

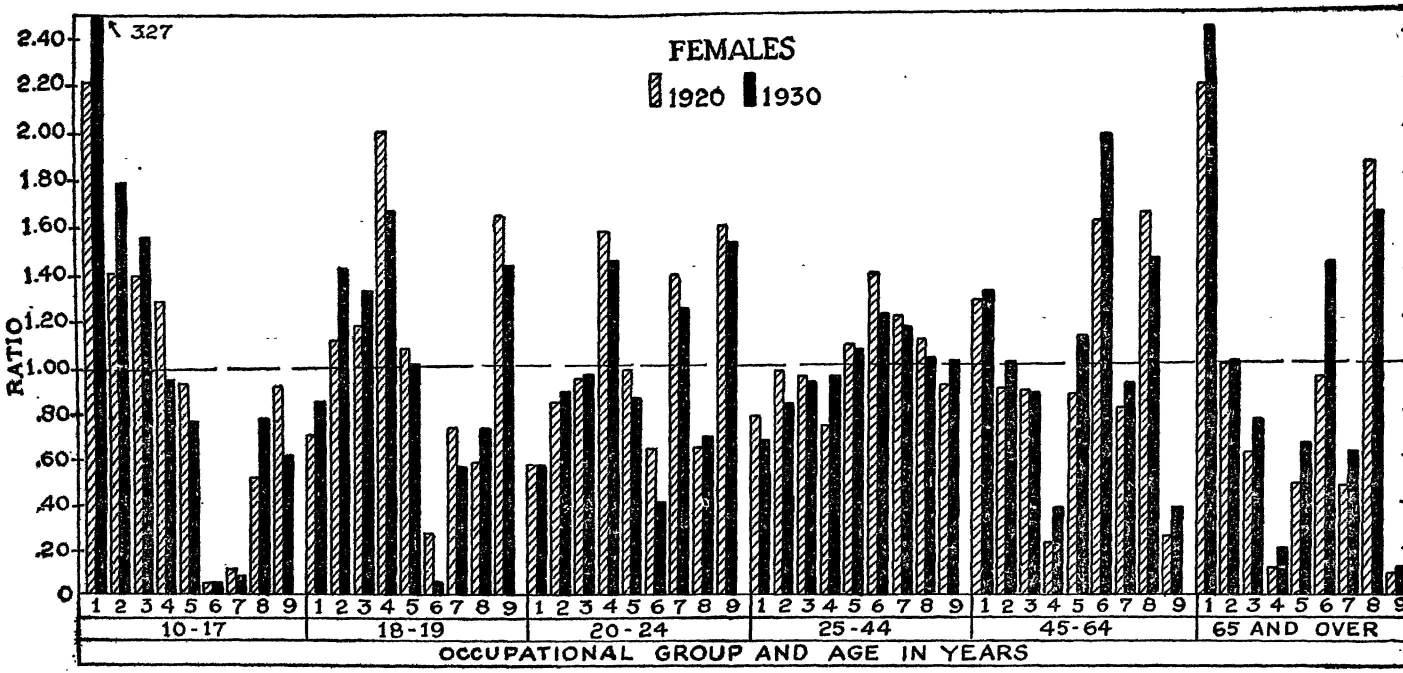

FIGURE 2.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, 1920 and 1930. The numbers 1–9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

TABLE 3.—*Ratio by sex and age, of percentage of gainful workers in a specified occupational group to the percentage for all groups, 1920 and 1930 (percentages shown in table 2)*

Occupational group	1920						1930					
	Age group						Age group					
	10-17	18-19	20-24	25-44	45-64	65 and over	10-17	18-19	20-24	25-44	45-64	65 and over
	Males						Males					
Agriculture, forestry, animal husbandry	1.58	1.06	0.92	0.85	1.09	1.48	2.13	1.31	0.96	0.78	1.08	57
Extraction of minerals	.84	1.14	1.06	1.13	.84	.46	.53	.98	1.06	1.10	.96	.49
Manufacturing and mechanical industries	.79	1.00	1.03	1.06	.95	.77	.59	.94	1.01	1.06	.99	.78
Transportation and communication	.49	.97	1.14	1.12	.90	.60	.43	.78	1.09	1.16	.89	.55
Trade	.66	.67	.84	1.07	1.10	.89	.72	.74	.85	1.08	1.03	.89
Public service (n. e. c.) [1]	.29	1.56	1.23	.87	1.11	1.41	.15	.60	.81	.98	1.19	1.61
Professional service	.13	.36	.76	1.14	1.13	1.15	.29	.47	.87	1.12	1.03	1.02
Domestic and personal service	.61	.62	.74	1.05	1.14	1.21	.66	.82	.87	1.02	1.06	1.15
Clerical occupations	1.83	1.76	1.58	.94	.60	.47	1.18	1.69	1.62	1.03	.64	.50
	Females						Females					
Agriculture, forestry, animal husbandry	2.22	0.70	0.57	0.78	1.28	2.18	3.27	0.85	0.57	0.68	1.31	2.43
Extraction of minerals	1.41	1.11	.84	.98	.90	1.00	1.79	1.43	.89	.84	1.01	1.01
Manufacturing and mechanical industries	1.40	1.18	.94	.95	.89	.61	1.56	1.33	.96	.93	.88	.76
Transportation and communication	1.29	2.00	1.57	.74	.23	.11	.95	1.67	1.45	.95	.38	.20
Trade	.93	1.08	.98	1.09	.87	.48	.77	1.01	.86	1.07	1.12	.66
Public service (n. e. c.) [1]	.06	.27	.64	1.39	1.61	.94	.06	.06	.41	1.22	1.97	1.43
Professional service	.11	.73	1.39	1.21	.81	.47	.09	.56	1.25	1.18	.92	.62
Domestic and personal service	.52	.58	.65	1.11	1.64	1.85	.78	.73	.69	1.03	1.45	1.64
Clerical occupations	.91	1.64	1.59	.91	.25	.09	.61	1.43	1.53	1.02	.38	.11

[1] N. e. c.=not elsewhere classified.

that particular group, the bar representing this fact will reach the dashed line. Obviously when the height of a bar is below (or above) the normal level the percentage of persons for the age group and group of occupations represented by the bar is less (or greater) than the percentage expected.

Variability of the ratios in the different age groups.—The first question that logically arises is: How do the number of gainful workers of different occupational groups approach the normal level in the various age groups; in other words, are there some age groups that are characteristically normal, above or below normal with respect to the number of gainful workers in the different occupational groups? The investigation of this question will obviously throw light on an important matter, namely, whether there is with respect to occupational group a dearth of workers in the middle-aged and old-aged groups, and whether there is an excess in the child group. An inspection of figures 1 and 2 immediately reveals that with respect to normality the age groups are by no means similar, and that the greater variability is shown by the females. The occupational groups for the age group 25–44 approach normality most consistently; this holds for females as well as for males, and for both census years. For the males the greatest variability appears to occur in the age group 10–17, followed in order by 65 and over, and 18–19; for the females the picture is remarkably different, considerable variability being found in all of the age groups with the exception of 25–44.

Age changes in the ratios.—For the males of the child group, 10–17 years, agriculture, forestry, and animal husbandry, and clerical occupations show an excess of gainful workers. In 1930 the former occupational group (agriculture, forestry, and animal husbandry) contained more than twice as many boys as expected and showed at the same time an increase over 1920; the clerical contained almost one-fifth more than the expected number but decreased since 1920. In both census years agriculture, forestry, and animal husbandry continued above normal in the age group 18–19, decreased below normal in the subsequent age groups, rose above normal in the middle-aged group, and increased to a high level above normal in the age group 65 and over. Clerical occupations continued above normal, decreased approximately to normal at 25–44, and fell approximately to 60 and 50 percent of normal, respectively, in the middle- and old-aged groups. Other occupational groups than clerical in the old-aged group showing fewer persons than expected are extraction of minerals, manufacturing and mechanical industries, transportation and communication, and trade, the differences as between 1920 and 1930 being small. An occupational group in the old-aged group remarkably above normal is public service; in no other male age group does this particular group of occupations reach a level so high.

Consider now the material for the females which is shown graphically in figure 2. The child group contrasts notably with the corresponding male group. The female child group shows the clerical occupations below normal, and the agriculture, forestry, and animal husbandry group considerably above normal. In fact in the latter group of occupations there were in 1930 over 3 times as many girls as expected. Furthermore, for both census years there are 2 other occupational groups, extraction of minerals, and manufacturing and mechanical industries, in the female child group that show percentages above normal; in 1920 the occupations connected with transportation and communication were above normal, but in 1930 they show a decrease below normal. Transportation and communication for both years rises abruptly far above normal in the age group 18–19; indeed this level is never reached in any of the subsequent age groups. On the other hand, these occupations are below normal for males of 18–19 years of age. While the professional service group is below normal for males of 20–24, it is about 30 percent greater than the expected number for females of the same age group. As in the instance of the middle-aged males in clerical occupations, the females of the same age and occupational group are below the expected number, the latter being on a still lower level. Transportation and communication also shows an unusually low level with respect to the middle-aged females. Public service, and domestic and personal service are on high levels, and particularly so when compared with the males. These two occupational groups continue to show high levels for the females of 65 and over, public service increasing remarkably from below normal to almost 50 percent above normal in 10 years. Agriculture, forestry, and animal husbandry show the greatest excess in the old-age group, the observed percentage of workers being well over twice the expected percentage in both census years.

SUMMARY

This paper deals with the age of gainful male and female workers of the United States in different occupational groups for the census years 1920 and 1930. The various occupational groups with the workers specific for sex, age, and census year are compared.

The percentage age distribution for each occupational group is compared with the percentage age distribution of all gainful workers regardless of occupation by forming the ratio of corresponding percentages. This ratio is equivalent to the ratio of an observed percentage to its corresponding "expected" or "normal" percentage, and depending upon whether the ratio is 1, less than 1, or greater than 1, indicates whether the number of workers in a particular occupational group is normal, abnormally low, or abnormally high; when the ratio differs from 1, its size indicates the order of magnitude of the abnormal-

ity. As a consequence of this definition of normality, the following findings, among others, may be briefly enumerated:

1. The ratios for the females are more variable than those for the males in both census years.

2. The variability of the ratios changes in both sexes with increases in age. The age group 25–44 years is least variable for both males and females in both census years.

3. With respect to the males, the child group, 10–17 years, shows agriculture, forestry and animal husbandry, and clerical occupations to have percentages of gainful workers greater than the expected percentages. The middle-aged group, 45–64 years, shows a dearth of workers principally in the clerical occupations. The old-aged group, 65 years and over, shows a dearth of workers in the following occupational groups: Extraction of minerals, manufacturing and mechanical industries, transportation and communication, trade, and clerical occupations. There is a notable excess in agriculture, forestry and animal husbandry, and public service. These observations hold for both census years.

4. With respect to the females, the child group shows excesses in agriculture, forestry and animal husbandry, extraction of minerals, manufacturing and mechanical industries, and transportation and communication (1920 only). The middle-aged group shows a dearth of workers principally in manufacturing and mechanical industries, transportation and communication, professional service, and clerical occupations. There are notable excesses in agriculture, forestry and animal husbandry, public service, and domestic and personal service. The old-aged group shows a dearth of workers in manufacturing and mechanical industries, transportation and communication, trade, professional service, and clerical occupations. There are striking excesses in agriculture, forestry and animal husbandry, public service (1930 only), and domestic and personal service. With the exceptions noted, these observations hold for both census years.

REFERENCE

(1) U. S. Department of Commerce, Bureau of the Census: (1933) Fifteenth Census of the United States, 1930. Population, v. 5, General Report on Occupations. Government Printing Office, Washington, D. C. P. 114.

IXODES RICINUS CALIFORNICUS (BANKS) A POSSIBLE VECTOR OF *BACTERIUM TULARENSE* [1]

By Gordon E. Davis, *Bacteriologist*, and Glen M. Kohls, *Assistant Entomologist, United States Public Health Service*

On April 18, 1936, two adult *Ixodes ricinus californicus* (*1*) were recovered near Grants Pass, Oreg., from a recently dead jack rabbit (*Lepus californicus californicus*). The rabbit's spleen was approxi-

[1] Contribution from the Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont.

mately 4 inches long by 1 inch wide and showed numerous necrotic foci, suggesting a tularaemic infection.

On April 22 the ticks were placed in a feeding capsule on a guinea pig. One attached immediately; the other died within 24 hours. The guinea pig's temperature was normal for 8 days, rose to 39.8° C. on the 9th day and 40.4°, 40.4°, 40.0°, 40.2°, respectively, on the following 4 days. On the fourteenth day it was killed for autopsy. The spleen was approximately normal in size. There were a few small abscesses in both spleen and liver.

Transfers were made by a suspension of spleen tissue and by testicular washings. The two guinea pigs receiving the latter died, following a febrile period, on the twentieth and twenty-fifth days, respectively. One showed a spleen enlarged approximately five times, studded with necrotic foci. There was also a focal necrosis of the liver and peritoneal wall with excess fluid in the abdominal cavity. The other showed a spleen slightly enlarged with focal necrosis in both spleen and liver. One of the two guinea pigs receiving spleen tissue died on the twentieth day, also showing lesions typical of tularaemia, including enlarged and caseated inguinal nodes. The other was killed on the fourteenth day. The spleen was slightly enlarged and showed pinpoint necrotic foci. The omentum major was caseated.

Transfers, by cutaneous vaccination with spleen tissue, were again made from one of each of the above pairs of guinea pigs. Blood taken on the seventh day from one of these second transfer guinea pigs yielded a pure culture of *Bacterium tularense*.

The following facts suggest that *I. ricinus californicus* may be a carrier of tularaemia to human beings: (1) It infests species of rodents known to be commonly infected in nature; (2) naturally infected adults have been found in nature; and (3) the adults frequently bite man.

REFERENCE

(*1*) Kohls, Glen M., and Cooley, R. A.: North American records of the tick *Ixodes ricinus californicus* (Banks). (The following article.—Ed.)

NORTH AMERICAN RECORDS OF THE TICK *IXODES RICINUS CALIFORNICUS* (BANKS)[1]

By Glen M. Kohls, *Assistant Entomologist*, and R. A. Cooley, *Entomologist, United States Public Health Service*

With the recent finding of *Ixodes ricinus californicus* naturally infected with *Bacterium tularense* in Oregon by Davis and Kohls (*1*) it seems desirable to summarize host and locality data of this common tick of the Pacific Coast region. In this note there are assembled all

[1] Contribution from the Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont.

of the known published records of this tick, together with new records that have been obtained by this laboratory.

Banks (*2*) records specimens from California as follows: Claremont, Santa Clara County, Santa Cruz Mountains, and Redwood Creek, Humboldt County. The hosts were gray fox and black-tail deer. Neumann (*3*) records this species on a bird, *Toxostoma crissalis* Wagl.; locality, California. Clarke (*4*) lists it as a parasite of black-tail deer, and Boynton (*5*) notes its occurrence on the southern black-tail, *Odocoileus columbianus scaphiotus,* and the Rocky Mountain mule-tail deer, *O. hemionus hemionus.* Jellison (*6*) states that "the adult tick is a serious pest of deer, livestock, and dogs and frequently bites man * * *". The same paper records the finding of an engorged nymph on a dog in Santa Clara County, larvae and nymphs on alligator lizards, *Gerrhonotus scincicauda scincicauda,* in San Luis Obispo County, on *Gerrhonotus coeruleus* in Humboldt County, and on blue-bellied lizards, *Sceloporus occidentalis occidentalis,* in Monterey County, San Benito County, and San Luis Obispo County, all in California. Finally, Gregson (*7*) reports it from Vancouver Island and the coast of British Columbia. The lizard *Gerrhonotus multi-carinatus* Blainville was found to be a host of the immature stages.

As a result of field studies conducted by members of the staff of the Rocky Mountain Laboratory, it is possible to add several new host species, representative records of which follow:

Hosts of adult stage.—Jack rabbit, *Lepus californicus californicus,* Grants Pass, Oreg.; brush rabbit, *Sylvilagus bachmani,* Corvallis, Oreg.; cougar, *Felis oregonensis,* Roseburg, Oreg. (R. E. Dimick); domestic cat, Gasquet, Calif.; horse, Orcas Island, Wash.; and coyote, *Canis* sp., Grants Pass, Oreg.

Hosts of immature stages.—Jack rabbit, *Lepus californicus californicus,* Grants Pass and Corvallis, Oreg. (larvae and nymphs); ground squirrel, *Citellus douglasii,* Grants Pass, Oreg. (nymphs); mouse (probably *Mus musculus*), Grants Pass, Oreg. (larvae); and *Citellus* sp., Redding, Calif. (nymph).

Distribution.—The writers have collected adults by dragging as far south as San Juan Hot Springs, San Diego County, Calif. Undoubtedly the species extends south into Lower California. The most inland record is Bass Lake, Madera County, Calif. (Jellison (*6*)). Gregson (*7*) gives as the most northerly point of collection Campbell River, 30 miles north of Courtenay, Vancouver Island. Judging from the paucity of records of its collection in Washington and northern Oregon, the species is probably sparsely distributed in that section of the Pacific coast region.

Seasonal occurrence.—The adults are most abundant during the winter and early spring months. We have an engorged female collected in January from a dog at Duncan, B. C. Jellison, in California,

during March and April found adults on vegetation in considerable numbers and also infesting dogs, horses, and man. The present writers found that the number of adults that could be collected from vegetation in California declined with the advance of spring, and during the summer months adults were practically absent. However, we have records from a coyote, Grants Pass, Oreg., August 15, 1935 (1 specimen), and from a black-tail deer, Green Mountain, Oreg., October 18, 1935 (1 specimen).

As to the seasonal occurrence of the immature stages the data are even more fragmentary. Jellison found them infesting lizards in numbers during March and April 1932, in California. Many larvae and nymphs were found on 2 jack rabbits from Grants Pass, Oreg., April 17, 1936. Two ground squirrels, *Citellus douglasii*, from the same area, examined July 17 and September 18, 1935, respectively, were each infested with a single nymph. Gregson states that only 1 of 59 lizards, *G. multicarinatus*, from West Vancouver, examined October 4 was infested by a tick. Thus it seems likely that the seasonal occurrence of immature stages on host animals coincides more or less with that of adults.

REFERENCES

(*1*) Davis, Gordon E., and Kohls, Glen M.: *Ixodes ricinus californicus* (Banks) a possible vector of *Bacterium tularense*. (Preceding Article.—Ed.)
(*2*) Banks, Nathan: A revision of the Ixodoidae, or ticks, of the United States. U. S. Dept. of Agri. Bur. of Ent. Tech. Ser. 15, p. 24 (1908).
(*3*) Neumann, L. G.: Ixodidae, p. 27 (1911).
(*4*) Clarke, F. C.: Parasites of the black-tail deer. Thesis. Univ. of California Library (May 1912).
(*5*) Boynton, W. H.: Deer as carriers of anaplasmosis. Science, *78:* 559–560 (1933).
(*6*) Jellison, W. L.: The parasitism of lizards by *Ixodes ricinus californicus*. J. Parasitology, *20:* 243 (June 1934).
(*7*) Gregson, J. C.: A preliminary report of the lizard-tick relationship on the coast of British Columbia. Proc. Ent. Soc. B. C. No. 31, pp. 17–21 (February 1935).

DEATHS DURING WEEK ENDED FEBRUARY 13, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 13, 1937	Corresponding week, 1936
Data from 85 large cities of the United States:		
Total deaths	10,452	10,317
Average for 3 prior years	9,189	
Total deaths, first 6 weeks of year	64,370	57,047
Deaths under 1 year of age	616	638
Average for 3 prior years	593	
Deaths under 1 year of age, first 6 weeks of year	3,847	3,400
Data from industrial insurance companies:		
Policies in force	69,161,259	67,901,211
Number of death claims	13,490	11,894
Death claims per 1,000 policies in force, annual rate	10.2	9.2
Death claims per 1,000 policies, first 6 weeks of year, annual rate	11.5	10.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 20, 1937, and February 22, 1936

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 20, 1937, and Feb. 22, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936
New England States:								
Maine		4	512	1	5	272	0	1
New Hampshire					20	24	0	0
Vermont					2	370	0	0
Massachusetts	8	11			833	357	6	3
Rhode Island	1		14		205	32	1	2
Connecticut	5		354	4	568	78	1	4
Middle Atlantic States:								
New York	51	37	[1] 74	[1] 92	402	1,810	18	20
New Jersey	6	12	110	11	1,251	100	7	3
Pennsylvania	46	34			204	616	9	4
East North Central States:								
Ohio	20	29	270	70	54	108	9	8
Indiana	6	20	220	34	12	11	3	2
Illinois	31	31	131	64	26	29	8	13
Michigan	32	13	12	4	56	50	4	2
Wisconsin	1	1	308	58	14	137	0	3
West North Central States:								
Minnesota	3	1	4	1	18	168	3	0
Iowa	5	11	64	5	4	8	2	3
Missouri	12	23	1,565	402	9	25	2	3
North Dakota	2		41	10	2		1	1
South Dakota	1	2	11		2	1	3	0
Nebraska		6	15		1	40	1	3
Kansas	8	16	240	22	6	16	1	2
South Atlantic States:								
Delaware			8		129	78	1	0
Maryland [2]	13	5	389	34	412	136	5	14
District of Columbia	5	21	27	3		8	2	4
Virginia	15	14			188	70	9	33
West Virginia	12	9	725	131	3	11	9	5
North Carolina	29	23	93	311	55	89	1	5
South Carolina [3]	4	2	1,116	1,272	12	17	1	10
Georgia [3]	13	9	1,189	1,058			3	4
Florida [3]	11	2	36	51	8	1	2	2
East South Central States:								
Kentucky	9	9	521	104	70	154	24	9
Tennessee	22	12	750	246	21	202	6	8
Alabama [3]	14	14	1,154	1,189	2	11	6	2
Mississippi [2]	3	1					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 20, 1937, and Feb. 22, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936
West South Central States:								
Arkansas	6	6	798	233	3	-------	3	2
Louisiana	13	14	375	21	1	70	1	5
Oklahoma [4]	8	5	1,018	227	6	1	5	9
Texas [3]	56	56	4,284	751	522	174	8	17
Mountain States:								
Montana	-------	-------	276	57	-------	30	2	1
Idaho	-------	2	9	2	29	44	1	0
Wyoming	-------	-------	1	-------	1	4	0	4
Colorado	4	5	-------	-------	1	14	0	1
New Mexico	2	3	287	6	63	9	2	0
Arizona	2	2	401	215	208	46	2	0
Utah [2]	2	-------	-------	-------	11	10	0	0
Pacific States:								
Washington	1	3	51	-------	12	236	1	2
Oregon	-------	1	852	148	12	642	0	1
California	30	37	4,126	5,030	83	1,817	11	7
Total	512	506	21,931	11,870	5,546	8,126	184	223
First 7 weeks of year	4,059	4,670	189,832	36,664	31,676	44,460	1,041	1,338

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936
New England States:								
Maine	0	0	23	24	0	0	0	1
New Hampshire	0	0	6	16	0	0	0	0
Vermont	0	0	11	16	0	0	0	0
Massachusetts	0	1	252	241	0	0	2	1
Rhode Island	0	0	58	17	0	0	1	0
Connecticut	0	0	105	78	0	0	1	0
Middle Atlantic States:								
New York	0	0	1,107	858	0	0	6	5
New Jersey	0	1	204	296	0	0	2	3
Pennsylvania	1	1	634	511	0	0	4	3
East North Central States:								
Ohio	0	0	212	280	1	1	1	2
Indiana	1	0	165	358	2	1	1	1
Illinois	0	1	657	706	40	6	6	4
Michigan	2	0	785	313	0	0	2	3
Wisconsin	0	0	320	573	5	12	0	1
West North Central States:								
Minnesota	1	0	199	273	8	16	0	1
Iowa	0	0	288	178	29	5	0	5
Missouri	0	0	301	215	70	5	1	1
North Dakota	0	0	59	64	6	10	2	0
South Dakota	0	0	69	68	3	23	0	0
Nebraska	0	0	112	150	3	42	0	0
Kansas	0	0	279	325	20	7	0	0
South Atlantic States:								
Delaware	0	0	18	6	0	0	3	0
Maryland [1]	0	1	42	78	0	0	1	2
District of Columbia	0	0	23	20	0	0	1	0
Virginia	1	0	16	88	0	0	2	2
West Virginia	1	0	57	38	3	0	1	1
North Carolina	0	0	42	24	0	1	1	1
South Carolina [1]	0	0	3	4	0	0	5	1
Georgia [1]	1	0	7	25	0	1	8	2
Florida [1]	0	0	8	4	0	0	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 20, 1937, and Feb. 22, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936	Week ended Feb. 20, 1937	Week ended Feb. 22, 1936
East South Central States:								
Kentucky	2	1	43	63	0	0	11	6
Tennessee	0	0	28	27	0	0	7	2
Alabama [3]	0	0	13	27	0	1	3	0
Mississippi [2]	0	0	7	16	1	0	4	1
West South Central States:								
Arkansas	3	0	10	17	4	0	0	4
Louisiana	1	0	8	15	0	3	5	3
Oklahoma [4]	1	1	31	31	1	0	2	3
Texas [3]	3	0	108	133	2	2	10	4
Mountain States:								
Montana	0	0	51	124	11	11	1	1
Idaho	1	0	32	88	4	5	4	0
Wyoming	0	0	11	83	0	10	0	0
Colorado	0	0	34	130	7	5	0	1
New Mexico	0	0	40	43	3	0	3	0
Arizona	0	0	30	28	0	0	2	0
Utah [2]	0	0	14	111	0	0	0	0
Pacific States:								
Washington	0	0	52	91	2	27	1	0
Oregon	0	0	41	59	10	1	2	4
California	0	1	252	368	9	1	2	9
Total	19	8	7,067	7,251	253	196	105	79
First 7 weeks of year	164	124	43,529	51,351	2,081	1,455	795	698

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 20, 1937, 12 cases, as follows: South Carolina, 1; Georgia, 4; Florida, 5; Alabama, 1; Texas, 1.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1937										
Georgia	14	71	1,719	442	27	27	8	93	5	19
Idaho	4	6	1,356		390		1	129	49	3
Indiana	14	103	1,579		48		0	909	33	5
Iowa	4	15	8,136	1	17		1	621	92	3
Louisiana	7	51	780	29	137	4	5	56	2	28
Maine	2	6	645		345		0	94	0	29
Maryland	29	57	1,179		1,152		0	341	0	5
Michigan	11	69	400	4	184		4	2,515		7
Minnesota	6	32	135		135		4	653	62	4
New Jersey	17	55	895	1	1,839		2	634	0	6
Nevada	1		614				1	40	0	0
Ohio	36	167	1,511		247		10	1,601	36	17
Oregon	2	3	5,928		42		4	178	85	3
Pennsylvania	25	197		1	395		2	2,388	0	40
South Dakota	4	3	1,285		14		2	359	44	1

Summary of monthly reports from States—Continued

January 1937

	Cases
Actinomycosis:	
Minnesota	1
Anthrax:	
Pennsylvania	1
Chicken pox:	
Georgia	319
Idaho	236
Indiana	545
Iowa	283
Louisiana	34
Maine	535
Maryland	732
Michigan	2,597
Minnesota	748
New Jersey	2,032
Nevada	28
Ohio	2,648
Oregon	235
Pennsylvania	5,082
South Dakota	104
Conjunctivitis:	
Georgia	3
Idaho	3
Maryland	1
Dengue:	
Georgia	6
Diarrhea:	
Maryland	5
Ohio (under 2 years; enteritis included)	10
Dysentery:	
Georgia (amoebic)	18
Georgia (bacillary)	6
Louisiana (amoebic)	13
Louisiana (bacillary)	2
Maryland	5
Michigan (bacillary)	2
Minnesota (amoebic)	2
Minnesota (bacillary)	1
New Jersey (amoebic)	1
Ohio (bacillary)	1
Oregon (amoebic)	2
Pennsylvania (amoebic)	1
Encephalitis, epidemic or lethargic:	
Iowa	1
Michigan	1
New Jersey	2
Oregon	1
Pennsylvania	1
German measles:	
Idaho	10
Iowa	3
Maine	18
Maryland	38
Michigan	119
New Jersey	101
German measles—Contd.	
Ohio	26
Pennsylvania	65
Hookworm:	
Georgia	1,236
Louisiana	10
Impetigo contagiosa:	
Maryland	7
Oregon	38
Jaundice, infectious:	
Oregon	1
Lead poisoning:	
Michigan	10
Ohio	8
Mumps:	
Georgia	223
Idaho	46
Indiana	117
Iowa	149
Louisiana	35
Maine	806
Maryland	849
Michigan	1,488
New Jersey	861
Ohio	269
Oregon	86
Pennsylvania	1,630
South Dakota	5
Opthalmia neonatorum:	
Maryland	1
New Jersey	9
Ohio	54
Pennsylvania	1
Paratyphoid fever:	
Louisiana	1
New Jersey	1
Puerperal septicemia:	
Georgia	2
Ohio	4
Rabies in animals:	
Indiana	48
Louisiana	22
Maine	1
Michigan	4
New Jersey	5
Scabies:	
Oregon	49
Septic sore throat:	
Georgia	84
Idaho	4
Iowa	1
Louisiana	2
Maine	5
Maryland	32
Michigan	72
Minnesota	6
Ohio	139
Oregon	10
Tetanus:	
Georgia	1
Maryland	3
New Jersey	1
Trachoma:	
Michigan	2
South Dakota	8
Trichinosis:	
Maryland	2
Michigan	60
New Jersey	2
Ohio	1
Tularaemia:	
Georgia	8
Louisiana	5
Maryland	7
Michigan	9
Minnesota	1
New Jersey	1
Ohio	21
Oregon	1
Pennsylvania	1
Typhus fever:	
Georgia	83
Undulant fever:	
Georgia	5
Iowa	6
Louisiana	1
Maine	1
Maryland	1
Michigan	6
Minnesota	2
New Jersey	7
Ohio	13
Pennsylvania	5
Vincent's infection:	
Maine	8
Maryland	15
Michigan	13
Oregon	13
Whooping cough:	
Georgia	134
Idaho	41
Indiana	199
Iowa	72
Louisiana	52
Maine	253
Maryland	622
Michigan	1,362
Minnesota	238
New Jersey	649
Nevada	5
Ohio	1,371
Oregon	179
Pennsylvania	2,511
South Dakota	8

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 13, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	8	0	0	9	5	0	0	0	3	24
New Hampshire:											
Concord	0	------	6	0	1	0	0	1	0	0	16
Manchester	0	------	0	0	0	0	0	0	0	0	18
Nashua	0	------	--------	0	------	0	0	------	0	0	--------
Vermont:											
Barre	0	------	0	1	0	1	0	0	0	2	1
Burlington	0	------	0	0	0	3	0	0	0	0	12
Rutland	0	------	0	1	1	0	0	1	0	0	9
Massachusetts:											
Boston	1	------	4	11	48	48	0	7	0	160	328
Fall River	0	------	4	63	5	2	0	0	0	4	31
Springfield	0	------	0	53	2	4	0	1	0	16	48
Worcester	0	------	0	142	17	3	0	1	1	35	75
Rhode Island:											
Pawtucket	0	4	0	19	0	1	0	0	0	0	26
Providence	0	18	9	134	18	41	0	3	0	14	113
Connecticut:											
Bridgeport	0	4	0	32	8	16	0	1	0	3	39
Hartford	0	32	1	1	6	14	0	1	0	2	57
New Haven	0	23	2	1	5	2	0	1	0	0	64
New York:											
Buffalo	0	9	5	24	24	23	0	9	0	29	169
New York	27	50	19	54	172	261	0	104	2	37	1,586
Rochester	0	------	5	0	15	1	0	3	0	16	101
Syracuse	0	------	2	20	7	51	0	3	1	14	65
New Jersey:											
Camden	1	6	3	0	5	11	0	0	0	6	38
Newark	0	10	1	284	11	18	0	8	0	22	111
Trenton	1	2	0	0	6	5	0	1	0	3	39
Pennsylvania:											
Philadelphia	7	18	11	3	72	154	0	32	0	84	601
Pittsburgh	3	25	12	9	22	45	0	4	0	31	183
Reading	0	------	1	2	0	10	0	1	0	28	36
Scranton	0	------	--------	0	------	16	0	------	0	1	--------
Ohio:											
Cincinnati	7	------	3	34	17	25	0	9	0	17	130
Cleveland	0	229	8	0	61	51	0	17	0	72	286
Columbus	1	7	7	0	15	5	0	1	0	3	89
Toledo	0	5	2	5	13	8	0	6	0	25	94
Indiana:											
Anderson	0	------	0	0	4	7	0	0	0	3	15
Fort Wayne	0	------	1	0	3	5	0	0	0	0	29
Indianapolis	1	------	10	2	26	15	0	8	0	11	133
Muncie	0	17	2	0	1	1	0	0	0	0	14
South Bend	0	------	0	0	5	4	0	0	0	2	26
Terre Haute	0	------	1	0	0	3	0	0	0	1	26
Illinois:											
Alton	0	------	0	1	0	10	0	0	0	1	6
Chicago	12	49	13	20	56	215	0	34	1	102	778
Elgin	1	------	0	0	3	4	0	0	0	8	12
Moline	2	------	0	1	3	1	0	0	0	6	16
Springfield	1	3	1	0	10	2	0	0	0	2	33
Michigan:											
Detroit	14	11	7	7	32	387	0	15	1	57	292
Flint	0	------	2	0	4	19	0	0	1	0	29
Grand Rapids	0	4	2	15	7	19	0	0	0	12	43
Wisconsin:											
Kenosha	0	------	0	0	0	4	0	0	0	1	9
Madison	0	------	0	0	1	3	0	0	0	5	24
Milwaukee	0	------	5	6	16	57	0	4	0	33	112
Racine	0	------	0	1	1	2	0	0	0	0	12
Superior	0	------	0	1	1	3	0	0	0	4	5
Minnesota:											
Duluth	0	------	2	0	3	0	0	0	0	4	26
Minneapolis	1	------	3	1	8	17	0	3	0	10	107
St. Paul	0	4	4	5	6	7	0	0	0	38	57

City reports for week ended Feb. 13, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0			0		6	0		0	1	
Davenport	0			0		3	0		0	0	
Des Moines	0			0		27	0		0	0	38
Sioux City	0			1		21	0		0	0	
Waterloo	0			0		21	0		0	9	
Missouri:											
Kansas City	0		11	0	29	76	0	6	0	5	141
St. Joseph	0		0	0	7	12	58	3	0	1	49
St. Louis	9	23	2	1	13	46	0	8	0	71	227
North Dakota:											
Fargo	0		0	0	2	6	2	0	0	0	9
Grand Forks	0			0		0	0		0	4	
Minot	0		0	0	0	0	0	0	0	0	5
South Dakota:											
Aberdeen	0			0		3	0		0	0	
Sioux Falls	0		0	0	0	1	0	0	0	0	7
Nebraska:											
Omaha	0		3	1	9	6	0	0	0	5	58
Kansas:											
Lawrence	0	10		0	3	0	0	0	0	0	
Topeka											
Wichita	0	1	1	0	9	7	2	0	0	1	35
Delaware:											
Wilmington	0		0	26	6	0	0	0	0	3	35
Maryland:											
Baltimore	5	72	8	307	44	18	0	9	0	85	272
Cumberland	0	1	0	0	2	1	0	1	0	7	11
Frederick	0		0	0	1	0	0	0	0	0	5
District of Col.											
Washington	6	53	10	32	39	17	0	8	0	19	207
Virginia:											
Lynchburg	0		0	5	3	0	0	0	0	0	12
Norfolk	1	7	2	1	6	3	0	0	0	0	27
Richmond	0		2	3	7	4	0	3	0	3	66
Roanoke	1		0	44	3	3	0	1	0	2	22
West Virginia:											
Charleston	1	6	1	0	4	3	0	0	0	0	24
Huntington	0			0		0	0		0	0	
Wheeling	0		0	0	2	0	0	1	0	2	25
North Carolina:											
Gastonia	0	1	0	0	0	0	0	0	0	0	
Raleigh	0		0	1	3	0	0	1	1	0	19
Wilmington	0		0	0	1	0	0	1	0	0	5
Winston-Salem	0	1	0	2	1	1	0	4	0	0	15
South Carolina:											
Charleston	1	184	3	0	3	1	0	1	0	0	27
Columbia	0		0	0	4	0	0	0	0	0	29
Florence	0		0	0	0	0	0	0	0	0	7
Greenville	1		0	0	1	0	0	0	0	0	6
Georgia:											
Atlanta	1	450	9	0	21	7	0	5	0	0	131
Brunswick	0	1	1	0	0	0	0	0	0	0	2
Savannah	0	124	1	0	2	0	0	1	0	6	32
Florida:											
Miami	0	5	0	2	0	2	0	3	0	2	33
Tampa	2	1	1	0	0	0	0	3	1	1	32
Kentucky:											
Ashland	0			0		0	0		0	0	0
Covington	0		1	0	7	0	0	3	0	0	21
Lexington	0	15	0	5	1	0	0	3	0	5	25
Tennessee:											
Knoxville	2	23	1	3	9	3	0	1	0	0	38
Memphis	3		11	4	28	4	0	6	0	14	135
Nashville	1		5	0	6	5	0	3	0	2	56
Alabama:											
Birmingham	1	185	2	0	12	6	0	3	0	3	84
Mobile	1	10	2	1	4	1	0	1	0	1	22
Montgomery	0	3		0		2	0		0	0	
Arkansas:											
Fort Smith	0			0		4	0		0	0	
Little Rock	1	14	0	0	13	2	0	1	0	0	15
Louisiana:											
Lake Charles	0		0	1	1	0	0	0	0	0	6
New Orleans	4	89	16	0	16	8	0	11	0	0	172
Shreveport	0		1	1	12	3	0	2	0	1	54

City reports for week ended Feb. 13, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Muskogee	0			0		3	0		0	0	
Oklahoma City	0	42	4	0	17	2	0	2	0	2	62
Tulsa	1			0		7	0		0	4	
Texas:											
Dallas	4	31	13	7	28	19	0	4	2	7	115
Fort Worth	0		6	42	6	8	0	0	1	1	46
Galveston	0		1	0	5	0	0	0	0	0	21
Houston	2		3	0	24	4	0	4	1	3	99
San Antonio	3	1	22	11	15	2	0	10	0	2	95
Montana:											
Billings	0	1	1	0	1	1	0	0	1	0	10
Great Falls	0		2	0	1	0	0	0	0	0	8
Helena	0	101	0	4	5	9	0	0	0	0	14
Missoula	0		0	0	0	0	0	0	0	0	8
Idaho:											
Boise	0		0	2	2	0	0	1	0	3	15
Colorado:											
Colorado Springs	0		0	0	2	9	0	1	0	1	8
Denver	2		3	3	22	13	0	5	0	41	114
Pueblo	0		0	0	1	3	0	0	0	0	6
New Mexico:											
Albuquerque	0	65	1	1	2	4	0	2	0	1	14
Utah:											
Salt Lake City	1		4	8	5	10	0	0	0	8	48
Washington:											
Seattle	0		11	4	17	4	0	5	0	1	100
Spokane	0	4	4	0	6	1	0	0	0	0	42
Tacoma	0		3	0	6	3	0	0	0	1	43
Oregon:											
Portland	0	30	12	2	15	2	3	1	0	7	113
California:											
Los Angeles	8	330	41	14	128	34	3	31	0	66	691
Sacramento	1	414	3	1	18	12	0	4	0	1	63
San Francisco	1	51	9	3	30	14	0	8	0	33	230

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	3	1	1
New York:			
New York	4	2	0
New Jersey:			
Newark	0	1	0
Pennsylvania:			
Philadelphia	1	1	0
Pittsburgh	3	0	0
Reading	1	0	0
Ohio:			
Cincinnati	4	1	0
Indiana:			
Anderson	1	0	0
Illinois:			
Chicago	3	0	0
Michigan:			
Detroit	2	0	0
Missouri:			
Kansas City	1	0	0
St. Joseph	0	1	0
Maryland:			
Baltimore	2	1	0
Virginia:			
Richmond	1	1	0
West Virginia:			
Charleston	1	0	0
Georgia:			
Atlanta	1	0	0
Tennessee:			
Nashville	0	0	1
Alabama:			
Birmingham	1	2	1
Louisiana:			
Shreveport	0	1	0
Oklahoma:			
Tulsa	1	0	0
Texas:			
Houston	0	1	0
Montana:			
Billings	1	1	0
Washington:			
Seattle	1	0	0
Spokane	1	0	0
California:			
Los Angeles	6	7	0
Sacramento	1	0	0
San Francisco	1	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Newark, 1; Cleveland, 1; Columbus, 1; Kansas City, 2; Baltimore, 1; Denver, 2.

Pellagra.—Cases: Charleston, S. C., 2; Atlanta, 2; Birmingham, 1; Dallas, 1; Los Angeles, 1.

Typhus fever.—Cases: New Haven, 1; Wilmington, N. C., 1; Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended January 30, 1937.—During the 2 weeks ended January 30, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Bruns-wick	Que-bec	Onta-rio	Mani-toba	Sas-katch-ewan	Alber-ta	British Colum-bia	Total
Cerebrospinal meningitis					1	1				2
Chicken pox		16	3	396	826	116	105	32	144	1,638
Diphtheria	2	17		98	36	6	2		6	167
Dysentery				1	2					3
Erysipelas				19	4	8	2	3	8	44
Influenza	4	19	63		1,140	512	121		2,296	4,155
Leprosy									1	1
Lethargic encephalitis				1						1
Measles		2	177	808	551	114	803	287	1,851	4,593
Mumps			341		590	22	44	15	137	1,149
Pneumonia	4	3			60		9		47	123
Poliomyelitis					3	2	2			7
Scarlet fever		12	11	202	362	133	100	122	53	955
Smallpox								3	1	4
Trachoma						1	2			3
Tuberculosis		29	19	114	87	32	4	3	33	321
Typhoid fever			2	23	5		2		4	36
Undulant fever				2	3					5
Whooping cough	1	16	1	366	201	10	25	4	60	684

CUBA

Provinces—Notifiable diseases—4 weeks ended February 6, 1937.—During the 4 weeks ended February 6, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Ha-bana	Matan-zas	Santa Clara	Cama-guey	Oriente	Total
Cancer	1	2	1	5		4	13
Chicken pox		5	1	9			15
Diphtheria	3	1	4	3		2	13
Leprosy		5	1				6
Malaria	190	42	21	192	135	582	1,162
Measles	34		1			6	41
Poliomyelitis	2						2
Tuberculosis	12	73	15	30	13	37	180
Typhoid fever	10	34	8	40	6	22	120
Yaws						1	1

CZECHOSLOVAKIA

Communicable diseases—December 1936.—During the month of December 1936, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	3		Paratyphoid fever	15	
Cerebrospinal meningitis	5	2	Poliomyelitis	10	
Chicken pox	334		Puerperal septicemia	35	14
Diphtheria	2,865	193	Scarlet fever	2,277	41
Dysentery	10	3	Trachoma	77	
Influenza	11,644	28	Typhoid fever	488	47
Lethargic encephalitis	1	1	Typhus fever	3	1
Malaria	20	1			

YUGOSLAVIA

Communicable diseases—January 1937.—During the month of January 1937 certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	26	3	Paratyphoid fever	5	1
Cerebrospinal meningitis	24	6	Poliomyelitis	4	2
Diphtheria and croup	767	95	Scarlet fever	330	10
Dysentery	18		Sepsis	12	3
Encephalitis	1		Tetanus	19	9
Erysipelas	255	12	Typhoid fever	300	30
Influenza	600	13	Typhus fever	148	15
Measles	312	4			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for February 26, 1937, pages 255–267. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued March 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India (French)—Chandernagor Territory.—During the period December 20, 1936, to January 9, 1937, 13 cases of cholera with 10 deaths were reported in Chandernagor Territory, India (French).

Plague

British East Africa—Tanganyika.—On February 15, 1937, 10 suspected cases of plague with 9 deaths were reported in Tanganyika, British East Africa.

Formosa—Taihoku District.—From December 1 to 10, 1936, one case of plague was reported in Taihoku District, Formosa.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—A rat found February 20, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been proved plague-infected.

India.—Plague has been reported in India as follows: During the week ended February 6, 1937, one case in Karachi; during the week ended February 13, 1937, five cases in Sind State.

Smallpox

Algeria—Department of Algiers.—From January 11 to 23, 1937, two cases of smallpox were reported in the Department of Algiers, Algeria.

Indochina—Saigon-Cholon.—During the week ended January 9, 1937, two cases of smallpox were reported in Saigon-Cholon, Indochina.

Typhus Fever

Peru.—During the month of November 1936, 60 cases of typhus fever were reported in Peru, by Departments as follows: Apurimac, 3 cases; Arequipa, 10 cases; Ayacucho, 3 cases; Cuzco, 17 cases; Huancavelica, 1 case; Huanuco, 5 cases; Libertad, 9 cases; Puno, 12 cases.

Yellow Fever

Brazil—Matto Grosso State—Maracaju.—On January 13, 1937, one death from yellow fever was reported in Maracaju, Matto Grosso State, Brazil.

French Equatorial Africa—Gabon—Libreville.—On February 8, 1937, a death from suspected yellow fever was reported in Libreville, Gabon, French Equatorial Africa.

Gold Coast—Accra.—On February 4, 1937, one case of yellow fever was reported at Accra, Gold Coast.

Ivory Coast—Bouake.—On January 17, 1937, a doubtful case of yellow fever was reported in Bouake, Ivory Coast. The diagnosis was not confirmed.

x

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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THE DISTRIBUTION OF *BRUCELLA melitensis* VARIETY *melitensis* IN THE UNITED STATES

By ALICE C. EVANS, *Senior Bacteriologist, National Institute of Health*

REVIEW OF THE LITERATURE

For many years after the recognition of Malta fever in Mediterranean countries, the United States was supposed to be free from that disease, now called brucellosis. The first series of cases in this country was found in Texas.

In 1911 Ferenbaugh reported that he had found 5 cases of Malta fever in Texas. All the patients had been in contact with goats. In the same year Gentry and Ferenbaugh published the results of a more extended investigation in which they diagnosed 7 human cases in addition to the 5 reported by Ferenbaugh. They found that 19.4 percent of the 128 goats which they tested were positive for *Brucella* agglutinins. Their investigations led them to believe that Malta fever had probably been endemic in Texas for at least 25 years.

The next year Yount and Looney reported 5 cases of Malta fever occurring in persons connected with the goat industry in Arizona; and in 1913 Yount reported another case, which was fatal. In that same year Wellman and Eustis diagnosed a case of Malta fever in Louisiana in a patient who had contracted the disease in Texas. They detected Malta fever in this patient by testing for *Brucella* agglutinins a group of serums which had been found to be negative to the Widal test. Among 46 serums tested, they found the one positive for *Brucella* agglutinins. It would seem that this one positive result might have suggested that brucellosis was not a rare disease and that further investigations might yield interesting data; nevertheless, no further significant investigations to find cases of brucellosis were carried out until a number of years later, when a definite outbreak occurred. In 1922 Lake, of the Public Health Service, diagnosed 35 cases of Malta fever in Phoenix, Ariz. He traced the source of infection to the milk of infected goats. From information obtained from local health authori-

ties and physicians, he was convinced that the disease had been present in Arizona at least 14 years.

Thus, during the early part of the present century the recognized cases of brucellosis in this country were associated with goats in the Southwestern States (excepting one isolated case recognized by Craig in Washington, D. C., in 1905). It was believed that the human disease was limited to caprine sources in the Southwestern States.

Recently Meyer and Eddie confirmed the incidence of *Brucella* infections in goats of the Southwest. They studied strains isolated from goats received from Phoenix, Ariz., and Carlsbad, N. Mex., and found that they belonged to the *melitensis* variety.

As the years passed, reports were made of the occasional isolation of the *melitensis* variety in various other parts of the country. Tyndale and Viko reported that the State veterinarian of Utah died in 1923 as a result of handling placental tissue from an infected goat. He had gone to the southern part of the State to investigate the goats following the death of two herders believed to have been infected with *Brucella*. *Brucella* were isolated from the urine of the veterinarian, but the strain was lost without having been classified. The caprine origin of the infection, however, and the severity of the disease, suggest that the strain concerned in these three cases must have been of the *melitensis* variety. Meyer (1936) and his collaborators have worked quite extensively in southern Utah, and they found the goats of that region to be infected with the *melitensis* variety.

In 1925 the writer published the results of a serological classification of *Brucella* strains isolated from man and domestic animals. Many of the cultures were from distant areas in the United States. The collection included cultures of the *melitensis* variety isolated (by the investigators already mentioned) from human cases in Texas and Arizona, one culture from an aborted bovine fetus in Maryland, and another from an aborted equine fetus in Iowa. Later, Huddleson studied these strains in respect to bacteriostatic reactions and confirmed the classification in the *melitensis* variety of all excepting the equine strain, which proved to be atypical in that it agreed with the *abortus* variety in its sensitivity to dyes.

Later, in 1925, after the results of the classification study had been published, the writer received serum from a human case of brucellosis in Rocky Mount, N. C. From this serum the *melitensis* agglutinins were only partially removed by absorption with *abortus* antigen. The reaction indicated that the infection was with the *melitensis* variety. A few years later, Huddleson reported that two strains isolated from bovine sources in Michigan belonged to the *melitensis* variety; and a few years after that Carpenter and Boak reported that they had isolated the *melitensis* variety from cow's milk in three widely separated towns in New York State. These scattered observations suggested

that infections with the *melitensis* variety were more widely distributed in the United States than was generally supposed.

In European countries also, cattle have been found to be infected with the *melitensis* variety. Shaw, a member of the British Royal Commission on Mediterranean Fever, reported that he cultivated "*Micrococcus melitensis*" from the milk of cows in Malta. Descriptions of these strains by which they might have been identified with the *melitensis* or *abortus* variety were necessarily lacking. More recently, Taylor, Lisbonne, and Vidal cultivated *Brucella* organisms from cows' milk in France and identified them with the *melitensis* variety according to modern methods.

Taylor and his collaborators, and also Gilles, Pérès, and Gulty, have reported that, in the east of France, where human infections are derived from cattle, the *melitensis* variety is responsible for about 95 percent of human infections, although in the cattle of that region the *abortus* variety is the more common cause of infection.

The infection of cattle with the *melitensis* variety is a matter of concern not only on account of the greater number of human cases which an infected cow may cause, but also on account of the greater severity of the human disease caused by the *melitensis* variety. Molinelli made a comparative clinical study of brucellosis indigenous to two sections of Argentina. In the Andes region the human infections are caused by the *melitensis* variety, and the illnesses were found to be much more severe, the mortality higher, the disease lasting longer, and nervous symptoms more common than in the littoral, where the infections are due to the *abortus* variety of the organism.

THE AGGLUTININ ABSORPTION TEST FOR THE DETERMINATION OF THE PREVALENCE OF INFECTIONS WITH *BRUCELLA MELITENSIS* VARIETY *MELITENSIS*

Incidental to the surveys regarding human cases of chronic brucellosis conducted by the United States Public Health Service in several sections of the United States, an opportunity presented itself to investigate the prevalence of *melitensis* infections in man in the surveyed areas by means of the agglutinin absorption test. The use of this test necessitates a discussion of its reliability in identifying the type of infection.

The most satisfactory method for determining the type of infection in any given case of brucellosis is to isolate the organism and study it. Cultures are not readily obtainable from every case, however, and that is particularly true in chronic cases. The agglutinin absorption technique offers another method of obtaining information as to the type of *Brucella* concerned in any given case.

If two samples of serum from a brucellosis patient are saturated, the one with the homologous antigen and the other with an antigen of a heterologous variety, and then the remaining agglutinins in each sample are tested against both the homologous and the heterologous antigens, a reaction will occur with the homologous antigen in the sample which was absorbed with the heterologous antigen, but no reaction will occur in the sample absorbed with the homologous antigen. The agglutinin absorption test may be carried out on any serum which has a titer of 1 to 160 or higher.

The advantage of the agglutinin absorption test is that it is applicable to cases from which cultures can not be obtained. On the other hand, there are limitations to the information which may be gained by the use of the agglutinin absorption test. It does not distinguish the *abortus* from the *suis* variety, for they behave alike serologically; further, there is a small percentage of *Brucella* strains which are atypical, with irregular correlations between the serological reactions and other characteristics. Since the usefulness of the agglutinin absorption test in distinguishing the *melitensis* from the *abortus-suis* group depends on the rarity of atypical strains, a knowledge of their prevalence is necessary for correct interpretation of data obtained by absorbing agglutinins from patients' serum.

In 1925, when the writer published the results of the serological classification of 68 *Brucella* strains, there was no other known test by which they could be differentiated. Four years later, when Huddleson devised the bacteriostatic tests which have proved so useful for classifying *Brucella,* 44 strains which had been classified by the writer were sent, at his request, for his study of the correlation of the two systems of classification. He reported irregularities in two strains (4.5 percent). One of the irregular strains was a foreign strain of bovine origin; the other was the equine strain from Iowa which has been mentioned previously.

Recently Veazie and Meyer reported the results of their study of 447 *Brucella* strains isolated in various parts of the United States and in foreign countries. Among them were 20 strains too rough to be classified. Among the remaining 427 strains only 26, or 5.8 percent, were atypical, in that they failed to conform both serologically and culturally to either the *melitensis* or *abortus-suis* type. Only 11 of their irregular strains, all of bovine origin, were isolated in this country. Eight of these 11 strains had been isolated from different cows in a single dairy.

Investigators of other countries have reported results similar to the American findings. Olin and Lindström studied 103 strains, the majority of which were from human cases in Sweden. Two strains (1.9 percent) were atypical.

Wilson studied over 300 *Brucella* strains. He divided them into two groups—the main group from many parts of the world, and a smaller group from the northeast, east, and southeast of France. In the main group of 165 strains, only 1 was atypical. In the group of 156 French strains, 41 were too rough to be classified, and a large percentage of the remaining strains gave atypical reactions. Ten subgroups were found. Thus the irregular strains of Wilson's collection were received from one geographical area, where the *Brucella* organism seems to be undergoing a transition.

Disagreeing with the results of other investigators is the report of Francis, who studied 23 strains and reported 10 of them (43.5 percent) irregular. His results cannot be explained on the ground that they came from some restricted locality where, as Wilson and also Veazie and Meyer have shown, atypical strains may be widely distributed. Francis' atypical strains were from 5 different localities in the United States, and one group of 3 bovine strains was from Germany. It is not clear why Francis, who studied a relatively few strains, should have obtained results so different from those of other investigators.

If American strains alone are considered, altogether 259 *Brucella* strains have been studied for correlation between serological and bacteriostatic reactions, with results as shown in table 1. Thus, among the American strains studied, 92.7 percent were typical strains, agreeing in classification when grouped according to bacteriostatic reactions or agglutinin absorption reactions. From this it may be concluded that neither test alone will classify individual strains as belonging to the *abortus-suis* or *melitensis* group with absolute certainty, but that collected agglutinin absorption data will give general information as to the types of infection prevalent in a given locality.

TABLE 1.—*Record of atypical Brucella strains isolated in the United States*

Observer	Number of strains studied	Atypical strains	
		Number	Percent
Evans and Huddleson	29	1	3.4
Francis	19	7	36.8
Veazie and Meyer	211	11	5.2
Total	259	19	7.3

AGGLUTININ ABSORPTION TECHNIQUE

In the present study the following technique was used to obtain information concerning the variety of the infecting strain in serums of a titer of 1 to 160 or higher:

The cultures used as absorbing antigens were no. 456 of the *abortus* variety and no. 428 of the *melitensis* variety. They were grown on

1 percent glucose agar in Blake bottles. Each bottle was inoculated with the entire growth from 1 agar slant suspended in about 1.5 cc of saline solution. After 48 hours' incubation the growth was washed off with about 15 cc physiological saline solution containing 0.5 percent formalin, by rocking the bottle in the hands. After standing in the refrigerator a few days the dense bacterial suspension was centrifugalized, the clear supernatant fluid was discarded, and saline solution containing 0.5 percent formalin was added to restore the original volume. This suspension was then standardized to a density equivalent to 20,000 parts per million of the silica standard.

In the earlier study (1925) it was found that an antigen of a density of 60,000 p. p. m. would absorb all homologous agglutinins from a serum with a titer of 1 to 640 when the absorption was carried out in a 1 to 5 dilution of the serum; an antigen of half that density would absorb all homologous agglutinins from a serum with a titer half as high; and an antigen of twice that density was required to absorb all homologous agglutinins from a serum with a titer twice as high. In this study an antigen of a density of 60,000 p. p. m. was always used to absorb serums of a titer of 1 to 640; and the density of the antigen was reduced proportionately to absorb serums of lower titer. Serums of higher titer were diluted to a titer of 1 to 640, and the diluted serum was absorbed with an antigen of a density of 60,000 p. p. m. The procedure was as follows:

An equal quantity of glycerine is added to the serum in the field before sending it to the central laboratory. It was found that the test required 1.4 cc of the serum-glycerine mixture to give sufficient absorbed serum of a 1 to 5 dilution for the test. It requires 10.5 cc of the stock antigen to obtain an antigen of a density of 60,000 p. p. m. to absorb the serum in a 1 to 5 dilution. The tube containing 10.5 cc of the stock antigen was centrifugalized, 8.4 cc of clear supernatant fluid was removed, and 1.4 cc of the serum-glycerine mixture was added to the remaining 2.1 cc of antigen. The sediment was emulsified and the tube was then placed in a water bath at 37° C. After 4 hours it was removed to the refrigerator. The next day the tube was again centrifugalized and the agglutinin titer of the clear supernatant fluid was determined by testing with both the *abortus* and *melitensis* antigens. For this test 0.5 cc of antigen of a density equivalent to 500 p. p. m. of the silica standard was added to each of the series of tubes containing the diluted serum. Protocols, with the data for two serums, are given in table 2.

TABLE 2.—*Type of Brucella infection as determined by agglutinin absorption tests*

Serum	Treatment of serum	Abortus agglutinins serum diluted 1 to—									Melitensis agglutinins serum diluted 1 to—								
		10	20	40	80	160	320	640	1,280	2,560	10	20	40	80	160	320	640	1,280	2,560
Charlotte, 209.	Not absorbed	2	3	3	3	3	0	0	-----	-----	2	3	4	3	3	2	0	-----	-----
	Absorbed with *abortus*.[1]	0	0	---	---	---	---	---	-----	-----	4	3	3	0	0	---	---	-----	-----
	Absorbed with *melitensis*.	0	0	0	0	0	---	---	-----	-----	0	0	---	---	---	---	---	-----	-----
San Antonio, 309.	Not absorbed	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	0
	Absorbed with *abortus*.	---	---	0	0	0	0	0	0	-----	---	---	0	0	0	0	0	0	-----
	Absorbed with *melitensis*.[2]	---	---	4	3	2	0	0	0	-----	---	---	0	0	0	0	0	0	-----

[1] Results indicate *melitensis* infection.
[2] Results indicate *abortus* infection.

RESULTS OF THE PRESENT STUDY

The brucellosis surveys were conducted especially for the purpose of finding chronic cases, which are likely to have serums with a titer of agglutinins too low for the absorption test. Occasionally, however, serums were received at the central laboratory with titers high enough for the test. Table 3 gives the results obtained with the serums from the three survey areas.

TABLE 3.—*Prevalence of Brucella melitensis variety melitensis in 3 survey areas, as indicated by agglutinin absorption tests with patients' serums*

Locality	Number of serums tested	Abortus infections		Melitensis infections	
		Number	Percent	Number	Percent
Charlotte, N. C.	7	2	28.6	5	71.4
San Antonio, Tex.	10	4	40	6	60
Kansas City, Kans.	10	8	80	2	20

Five out of 7, or 71.4 percent, of serums from cases in the Charlotte (N. C.) area; six out of 10, or 60 percent, of serums from cases in the San Antonio (Tex.) area; and 2 out of 10, or 20 percent, of serums from the cases in the Kansas City (Kans.) area gave results indicating infection with the *melitensis* variety. At any rate, the infecting strains in these cases were not of the *abortus-suis* type. They were either *melitensis* infections or infections with atypical strains. Judging from the review of literature, the great majority of these cases must have been infected with the *melitensis* variety. In all of these cases the infection had been contracted in the State where the study was made.

DISCUSSION

It was to be expected that a large percentage of the cases of brucellosis in Texas would be found to be infected with the *melitensis* variety. It was surprising, however, to find that the majority of human cases studied in the North Carolina area and a considerable percentage of the cases in the Kansas area were infected with the *melitensis* variety.

Since comparatively few goats are raised in the United States outside of the Southwestern States, the spread of human brucellosis infections with the *melitensis* variety must depend largely on the susceptibility of cattle to this infection. Hence, the reports of cattle infected with the *melitensis* variety are of great interest.

On account of the much higher virulence of the *melitensis* variety for man, we can expect that whenever it infects cattle in any community in this country our experience will be the same as that in the east of France—the proportion of human infections with the *melitensis* variety to infections with the *abortus* variety will be far greater than the proportion between the two varieties incident in cattle. As in Argentina, we in this country may also expect a greater proportion of severe cases in regions where the *melitensis* variety exists.

Cultural studies are being made on some of the chronic cases in two of the survey areas, and it is hoped that the observations reported here may be extended by the study of strains.

SUMMARY

Human infections with *Brucella melitensis* variety *melitensis* have long been known in southwestern United States. In the literature are found records of occasional human and bovine infections with the *melitensis* variety in various other sections of the United States.

A review is given of the reports in which the grouping of *Brucella* according to serological reactions is correlated with the grouping according to bacteriostatic reactions. Excepting in certain restricted localities, there is a low percentage of atypical strains in which the groupings according to the two systems do not agree. Of 259 American strains which have been studied by various investigators, only 19 (7.3 percent) were atypical. Hence, although agglutinin absorption tests will not classify an individual *Brucella* strain in the *abortus–suis* or *melitensis* group with absolute certainty, collected data will give information as to the types of infections in a given locality.

The results of this study indicate that the percentages of human infections with the *melitensis* variety in the 3 survey areas were as follows: In Charlotte, N. C., 5 out of 7 brucellosis cases, or 71.4 percent; in San Antonio, Tex., 6 out of 10 cases, or 60 percent; in Kansas City, Kans., 2 out of 10 cases, or 20 percent.

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PULMONARY TUMORS IN MICE

II. The Influence of Heredity upon Lung Tumors Induced by the Subcutaneous Injection of a Lard-Dibenzanthracene Solution[1]

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FREQUENCY OF OCCURRENCE

While primary lung tumors are not common in most species of animals, they are known to occur with exceptional frequency in mice. In fact, the prevalence of pulmonary growths in mice is one of the most striking features in the study of malignant tumors in this species. Livingood (*12*), in 1896, first described a primary lung tumor which arose in a bronchus of an albino mouse and which he diagnosed as an adenocarcinoma. Haaland (*7*) reported five instances of spontaneous lung tumors in mice, but Tyzzer (*21, 22*) was the first investigator to give these growths thorough consideration. He observed primary lung nodules in 12 mice ranging in age from 5½ months to "very old", among which were 5 white, 3 gray, 2 black, 1 brown, and 1 black and white animals. A detailed and extensive description of each of these tumors was given, and the conclusion was reached that most of them "correspond to a single type, although there are minor variations." Mitosis was observed in only one case, but in two cases the growths extended into bronchi and were undoubtedly malignant. It was found difficult "to decide what name to apply to this type of tumor", but they were finally designated as "papillary cyst-adenoma." A total of 83 spontaneous tumors in 70 mice was found, of which 62 percent were primary lung growths, and the conclusion was reached that, in mice, primary tumors appear to be more frequent in the lungs than in any other organ.

Tyzzer described two types of growth, the first being the "papillary cyst-adenoma", in which the epithelium is arranged in a single layer upon irregular folds of supporting tissue and resembling in certain respects the structure of the lung. The tumor cells are either columnar or cuboidal and have no cilia. He could not decide whether the tumors arose from the epithelium of the bronchi or alveoli, and stated that "in most cases it resembles the bronchial epithelium, but it sometimes resembles the thickened alveolar epithelium." The paucity of mitotic figures was noted, which indicated that the growth rate of such tumors must be very slow. He concluded that some of the tumors "must be considered carcinomata because of the irregular growth of the epithelium." The second type of growth was designated as an "epidermoid carcinoma" of the lung with diffuse growth of epithelium showing a tendency to keratinization. This type of growth is much

[1] From the Office of Cancer Investigations, U. S. Public Health Service, Harvard Medical School, Boston, Mass.

rarer than the papillary cyst-adenoma type. Tyzzer also called attention to the fact that the lungs of mice frequently exhibit areas of chronic inflammatory hyperplasia.

In addition to his descriptions of these growths, to which little has been added by subsequent observers, Tyzzer also discovered the influence of heredity upon their development. Starting with a female mouse with a lung tumor and a male free from tumor, he obtained 62 progeny which reached maturity, and of these 27 percent developed primary lung nodules.

Jobling (*10, 11*) found primary lung growths to be next in frequency to mammary gland carcinomas in a series of 26 mice exhibiting 41 spontaneous tumors of which 29 arose in the mammary glands and 9 in the lungs. Haaland (*8*) described 353 primary tumors in mice and, while not giving complete statistics, states that "the adenomatous tumours of the lung vie with the mammary tumours in frequency." His studies led him to conclude that a large proportion of the lung growths are "undoubtedly malignant", but in some cases "their exact nature is uncertain", since many appeared to be hypertrophic changes instead of malignant growths. Nodules occurred only in the lungs of old mice and were often associated with chronic inflammatory processes, which were noted frequently in the lungs of normal mice.

Slye, Holmes, and Wells (*17*) were the next investigators to comment upon the spontaneous lung tumors of mice. After reviewing the earlier literature, they concluded that these growths are peculiar not only in frequency but also in structure, when contrasted with pulmonary tumors of other species. They observed 160 mice bearing lung nodules in the first 6,000 autopsied mice of Slye's stock; lung tumors constituted one-third of all tumors found in the 6,000 autopsies and were next in frequency to mammary gland tumors. Only those nodules "that seem fairly entitled to be classed as tumors" were included, and in accord with Tyzzer and Haaland they commented upon the "many nodules caused by inflammatory hyperplasia." The authors presented an interesting table of lung tumors in their mice in which the tumors were tabulated as to their growth characteristics. Of the 160 nodules, 20 were classed as "unquestionable carcinomas", 43 as showing "a reasonably sure malignant tendency", 41 as of "doubtful malignancy", and 56 as "benign". The types of growth ranged from those which exhibited active infiltration and regional metastases in the lungs to the "benign" nodules which they regarded as true tumors and not "inflammatory hyperplasia."

The nodules usually appeared in mice over 1 year of age, and sex apparently had little influence on their occurrence. In addition, Slye, Holmes, and Wells were the first to observe the presence of metastases outside the lungs. Four such cases were reported, two exhibiting secondary growths in the mediastinal lymph nodes and

two in the mediastinal lymph nodes, chest wall, diaphragm, and kidney. So far as heredity is concerned, the statement was made that "Hereditary influences show a marked relation to the occurrence and character of these lung tumors." Hill (*9*) raised mice on varied beddings and diets. These factors had little influence on the origin of spontaneous tumors, but in 793 experimental and control mice he found 140 with spontaneous pulmonary growths.

Other investigators have noted the occurrence of primary lung tumors in mice, but it is believed that the reports referred to above are sufficient to establish the fact that in this species pulmonary growths appear with unusual frequency. It is necessary to remember that many of these observations were made in mice which had not been inbred and therefore may be regarded as presenting the incidence of lung tumors in laboratory mice. With the advent of studies pertaining to the effect of inbreeding on the occurrence of cancer in mice, it was only natural that investigators should concentrate on tumors which arose in sites easily accessible to macroscopic examination and the mammary glands were found to meet this requirement. However, the influence of heredity on pulmonary growths in mice has received attention from some investigators.

INFLUENCE OF HEREDITY

Lynch (*13, 14, 15*) has given this problem extensive consideration by recording the lung tumor incidence in two strains of mice. One of these, strain 1194, was inbred from the sixth to the fifteenth generation by brother to sister matings, "or rarely cousin by cousin", and consisted mostly of black agouti mice, although a few were pinkeyed or brown agouti. Lynch found a lung tumor rate of 6.7 percent in strain 1194 animals in a total of 208 mice that lived longer than 1 year. The youngest age at which a lung tumor was found at autopsy was 18 months. The other strain studied was Lynch's line of the Bagg albinos. In 135 individuals of this strain that lived to be at least 1 year old, Lynch recorded a lung tumor incidence of 37.04 percent. The youngest age at which a lung tumor was found at autopsy was 15 months. Crosses between these two strains produced 14 individuals of the first generation that lived 16 months or longer, and of these, 5, or 31 percent, developed lung tumors. Of the second outcross generation 49 mice lived to be more than 1 year of age, and of these, 11, or 22 percent, developed lung tumors. From these results Lynch suggested that lung tumor susceptibility is inherited as a dominant character.

Lynch also ascertained the incidence of lung nodules in the offspring of mice that had or did not have lung tumors. The results may be briefly summarized as follows: Lung tumors arose in 19 percent of the progeny of mice which were free from lung tumors when autopsied;

in 40 percent of the progeny of parents, one of which had lung tumor; and in 48 percent of the progeny of parents, both of which had lung tumors. Since pulmonary growths appeared in the mice whose parents were both free of lung tumor, Lynch suggested that "tumor susceptibility is not only dominant but variable." Other studies led her to conclude that sex had but little influence on the occurrence of lung tumors and that the lung growths were found most frequently in mice coming to autopsy when 2 years of age or older.

Lynch has presented further evidence that lung tumor susceptibility is inherited. A new stock of albino mice, designated as strain D, is introduced which had a lung tumor rate of 34 percent in mice over 6 months of age. A male mouse of strain D was bred to 6 females of strain 1194 and the 45 progeny which lived more than 6 months showed a lung tumor incidence of 24.4 percent. Male mice of the first generation were backcrossed to females of the parent stocks. When backcrossed to females of strain D, the progeny, numbering 404 individuals, gave a lung tumor incidence of 32.2 percent; but when the males were backcrossed to females of strain 1194, the progeny, numbering 218 mice, gave a lung tumor rate of 7.3 percent. Thus it was again indicated that the tendency to develop pulmonary growths is inherited. In other reports Lynch (*16*) has presented evidence to show that tar-painting may be utilized to demonstrate the inheritance of this organ susceptibility.

A strain of highly inbred mice with a high incidence of spontaneous pulmonary growths has been described by investigators of the Roscoe B. Jackson Memorial Laboratory. These mice designated as strain A have, according to Strong (*19*, *20*), descended from the Bagg albino strain. Bittner (*4*, *5*) states that 55 percent of males living 10 months or longer develop pulmonary growths, and of breeding females which develop mammary gland tumors 36 percent also have lung nodules. In the course of a crossbreeding experiment between this stock and another which does not give rise to lung tumors he found primary lung growths in the hybrid animals. Recently Bittner (*6*) has published a thorough study of the lung tumor incidence in this interesting strain of mice. Of 123 breeding females coming to autopsy, 26.1 percent had primary lung tumors. Of 126 virgin females, 77 percent developed primary lung growths, the average age at autopsy being 16.6 months. Of 116 breeding males, 71.6 percent exhibited primary pulmonary tumors, the average age at autopsy being 14.8 months. Thus, of 242 virgin females and breeding males of this strain, 181, or 74.7 percent, developed lung tumors spontaneously.

EXPERIMENTAL

Mice of strain A have been used in this laboratory (*1*, *2*) in investigations of the appearance of lung tumors following subcutaneous

injections of a lard solution of 1, 2, 5, 6-dibenzanthracene. It has been found (*3*) that this carcinogenic compound acts similarly to tar in eliciting lung tumors in mice and that mice of strain A are excellent test animals for such experiments. The idea suggested itself that a cross-breeding experiment between strain A mice and a strain known to exhibit a low incidence, if any, of spontaneous lung growths might be of interest. Mice of the C 57 black strain were chosen as suitable (*18*) for the experiment. It was decided to inject a lard-dibenzanthracene solution subcutaneously into most of the experimental animals in order to test for susceptibility to lung tumors. This procedure should also yield some information as regards the influence, the age, sex, or color of the progeny might have on their susceptibility to the carcinogenic action of the compound in both the lungs and subcutaneous tissues.

RESULTS OF CROSS-BREEDING

Young adult mice of the pure strains A and C 57 black were mated on July 15, 1935, as follows: 21 females of strain A to males of strain C 57 black and 21 females of strain C 57 black to strain A males. There were 179 black offspring (96 females and 83 males) born between August 15 and October 5, 1935.

On October 30, 1935, the females of the first hybrid generation were mated to their brothers and, as the result of this mating, 665 mice were obtained. The sex and color of the second hybrid generation are summarized below:

	Females	Males	Total
Black	175	205	380
Albino	86	86	172
Brown	53	60	113
Total	314	351	665

DIBENZANTHRACENE INJECTIONS

A sufficient quantity of a lard-dibenzanthracene solution was made up to last throughout the course of the experiment in order to obviate any difference in results which might be attributed to different solutions. Each cubic centimeter of lard contained 4 milligrams of 1, 2, 5, 6-dibenzanthracene; the procedure for preparing the solution has been described (*1*) elsewhere.

On November 1, 1935, all living females (38) of both strain A and C 57 black, along with 55 males and 4 females of the first hybrid generation, each received 0.2 cc of the lard-dibenzanthracene solution in the subcutaneous tissue of the right axillary region. The injection was repeated on November 15, 1935.

On January 22, 1936, 92 females of the first hybrid generation which had been used as breeders and 370 mice of the second hybrid generation were available. Of these, 62 mice of the first hybrid and 305 of the second hybrid generations were each given 0.2 cc of the lard-dibenzanthracene solution in the right axilla. Thirty of the first and 65 of the second hybrid generations and litter mates of the injected mice were set aside as normal controls. The experimental mice received another 0.2 cc injection on February 5, 1936. The color and sex of the injected mice of the second hybrid generation were divided as follows:

	Female	Male	Total
Black	58	73	131
Albino	50	51	101
Brown	34	39	73
Total	142	163	305

RESULTS IN PURE STRAIN ALBINOS AND C 57 BLACKS

Thirty-eight of these females received the first injection on November 1, 1935. The first tumor was found on February 12, 1936. Between the time of injection and the time of appearance of the first subcutaneous tumor, 15 of the strain A and 8 of the strain C 57 blacks had succumbed to an epidemic of *B. piliformis* (*23*). Lung tumors were found in one of the strain A mice; none of the others had tumors when autopsied. Of the 10 remaining C 57 black mice, 9 developed subcutaneous tumors and 1 died without any evidence of tumor. None had macroscopic lung nodules. Of the five strain A mice, four developed both subcutaneous and lung tumors. One died on March 3, 1936, without a subcutaneous tumor but with multiple lung nodules.

RESULTS IN THE FIRST HYBRID GENERATION

These were black mice, 55 males and 4 females, which received an initial lard-dibenzanthracene injection on November 1, 1935. Ten of the males died tumor-free before February 2, 1936, when the first subcutaneous tumor was noted. Of the remaining 49 mice, 47 developed subcutaneous tumors and 42 developed lung tumors; 1 mouse died without a tumor.

There were 62 black mothers of the second hybrid generation which received their first lard-dibenzanthracene injection on January 22, 1936. Only one of these had died when the first subcutaneous tumor appeared on April 23, 1936. Of the remaining 61 animals, 54 developed subcutaneous tumors and 57 developed lung tumors.

The last three mice were killed on November 25, 1936. None of these had a subcutaneous tumor, but the lungs of all three contained multiple lung growths. Up to July 23, 1936, 39 of this group developed subcutaneous tumors and had been autopsied; 35 of them exhibited multiple lung nodules. On July 23, 1936, 11 of the uninjected controls were killed and examined for the presence of macroscopic lung nodules; 10 were negative and 1 had a single lung nodule.

RESULTS IN THE SECOND HYBRID GENERATION

These animals received their first injection on January 22, 1936, and the first tumor arose on April 23, 1936, just three months later. Prior to April 23, 12 had died without any macroscopic tumor. The animals were examined once each week for the appearance of subcutaneous growths, and all were autopsied for the presence of lung tumors. Up to July 23, 1936, only 10 of these mice died from other causes; and of these, 5 had lung tumors only and 5 were negative in both subcutaneous tissue and lungs.

On July 23, 1936, there were 62 of these mice (17 males and 45 females) alive. All of them and 26 normal controls of the same hybrid generation were killed and autopsied. The findings in these 88 mice are summarized below:

	Injected mice	Control mice
No macroscopic tumor	8	25
Subcutaneous tumor only	1	0
Lung tumors only	43	1
Subcutaneous tumor and lung tumors	10	0

It is seen that 43 of the injected mice had lung tumors only, and it should be mentioned that of the 62 injected mice, 53 exhibited multiple lung tumors, while of the 26 controls only 1 had a single pulmonary growth.

A summary of the findings as regards the appearance of subcutaneous and lung tumors in all the first and second hybrid generations is presented in table 1.

TABLE 1.—*Subcutaneous and lung tumors in first and second hybrid generations following subcutaneous injections of a lard-dibenzanthracene solution*

	First hybrid generation	Second hybrid generation	First generation controls killed on 7/23/36	Second generation controls killed on 7/23/36
Died or killed without tumor	12	26	10	25
Subcutaneous tumors only	10	60		
Lung tumors only	8	48	1	1
Both subcutaneous tumors and lung tumors	91	171		

An analysis of the results in the second hybrid generation has thus far failed to reveal any influence exerted by color, sex, or pedigree upon the occurrence of the induced lung growths.

THE INFLUENCE OF SEX ON THE APPEARANCE OF SUBCUTANEOUS TUMORS

As stated previously, the mice were examined each week for the presence of subcutaneous tumors; and as the tumors arose, the mice were placed in other cages for observation or were killed and autopsied. As the experiment progressed, this procedure drew attention to the fact that cages containing male mice of the second hybrid generation were emptied earlier than those in which the females were kept. At the conclusion of the experiment the time of appearance of the subcutaneous tumors in both the first and second hybrid generations was tabulated, according to sex. The findings are summarized in table 2. Attention is directed to the first column of figures in the table, which indicates the number of mice alive at the time the first subcutaneous tumor arose and not the total number of mice injected. In the table the numbers of new tumors discovered each week are listed according to the sex of the animal in which they arose. Just below these figures and in heavy face type is the weekly percentage of the total number of mice of each sex developing subcutaneous tumors. It is seen that the males of both generations responded to the carcinogenic agent by developing tumors earlier than did the females.

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TABLE 2.—*Time in weeks of the appearance of dibenzanthracene tumors*

Hybrid generation	Sex	Number of injected mice alive when first tumor arose		14	15	16	17	18	19	20	21	22	23	24	25	26	27	31	32	34	36	37	40	Total number of tumors	Died or killed without subcutaneous tumor
				(a) Numbers of new tumors and (b) total percentages of mice with tumor																					
First	Male	45	(a)	1	----	6	3	3	4	9	5	2	5	1	2	----	1	1	----	----	----	----		43	2
			(b)	2	2	15	21	28	38	56	67	71	82	84	89	----	93	95	----	----	----	----	----		
Do	Female	65	(a)	3	2	4	2	2	2	7	2	4	6	3	1	3	5	4	2	2	2	1	1	58	7
			(b)	5	8	14	17	20	23	34	37	43	52	57	58	63	71	77	80	83	86	88	89		
Second	Male	147	(a)	5	2	8	11	16	16	16	16	10	11	3	5	5	5	----	----	----	----	----	----	129	18
			(b)	3	4	10	17	28	39	50	61	68	75	77	80	84	87	----	----	----	----	----	----		
Do	Female	146	(a)	1	1	4	6	10	19	7	5	6	8	8	10	11	6	----	----	----	----	----	----	102	44
			(b)	0.6	1	4	8	15	28	32	35	39	45	51	58	66	70	----	----	----	----	----	----		

SUMMARY AND CONCLUSIONS

In this experiment 21 females of strain A were bred to males of strain C 57 black, and 21 females of strain C 57 black were bred to males of strain A. The mice of strain A are known to be susceptible to both spontaneous and induced lung tumors, while the mice of strain C 57 black are known to be very resistant to the development of all spontaneous growths, and in this laboratory no lung tumors have thus far been induced in them by the subcutaneous injection of a lard-dibenzanthracene solution. The progeny of this mating has been designated as the first hybrid generation. Females of the first hybrid generation were mated to their brothers to procure mice designated as of the second hybrid generation.

Most of the first hybrid generation were injected subcutaneously with a lard-dibenzanthracene solution. Out of 121 of the injected animals, 11 died without tumor before the appearance of the first subcutaneous tumor at the injection site. Practically all the remaining 110 mice were kept under observation for the occurrence of subcutaneous or lung tumors; the last 3 were killed 11 months after the initial subcutaneous injection. Of the 110 animals, 101, or 91.9 percent, developed a subcutaneous tumor and 99, or 90 percent, developed lung nodules.

Of the second hybrid generation, 305 mice of black, white, or brown coat color were injected subcutaneously with a lard-dibenzanthracene solution. Twelve of these died tumor-free before the appearance of the first subcutaneous tumor. The remaining 293 mice were kept under observation for 6 months, during which time 231 developed a subcutaneous tumor or died from other causes. At the end of the 6-month period the remaining 62 mice were killed and autopsied for subcutaneous and lung tumors. It was found that up to 6 months after the initial injection of these 293 mice, 231, or 78.8 percent, had developed a subcutaneous tumor, and 219, or 74.7 percent, had developed lung nodules.

The occurrence of all subcutaneous tumors in the two generations cannot be compared, because the first generation mice were kept for 11 months and the second generation mice kept for 6 months after the initial lard-dibenzanthracene injection. However, table 2 reveals that 88, or 80 percent, of the first generation had developed subcutaneous tumors 6 months after the first injection.

The first generation mice were hybrids from reciprocal crosses between a strain of mice in which the females exhibit a high incidence of spontaneous mammary tumors (strain A) and a line in which the females show a low incidence of mammary tumors (strain C 57 black). Investigators (*18*) at the Roscoe B. Jackson Memorial Laboratory have found that such reciprocal crosses reveal an extra-chromosomal

influence in the occurrence of spontaneous mammary gland tumors, for hybrids derived from females which belong to high tumor lines develop more mammary tumors than those derived from females belonging to low tumor lines. The findings in the first hybrid generation mice of this experiment indicate that the progeny from either outcross were equally susceptible to the carcinogenic action of dibenzanthracene. This was to be expected, for previous investigations (*1*) have shown that both high and low spontaneous mammary tumor lines are susceptible to the development of induced dibenzanthracene tumors.

So far as the occurrence of lung tumors is concerned, 90 percent of the first hybrid generation mice and 74.7 percent of the second hybrid generation developed these growths. The fact that 62 of the second generation mice were killed 6 months after injection, and before a subcutaneous tumor was present in most of them, had little influence on the percentage developing lung nodules, for it will be recalled that 53 of the 62 mice exhibited lung nodules when examined at autopsy.

The absence of lung growths in a high proportion of uninjected controls of both the first and second hybrid generations shows that the lung nodules in the injected mice did not arise spontaneously and, in addition, shows that the lungs of the 62 second generation mice killed on July 23, 1936, were more responsive to the induction of tumors than the subcutaneous tissues, for 43 had multiple lung tumors without any evidence of a subcutaneous growth. This finding is similar to the results obtained in other experiments (*3*) with strain A mice.

The presence of lung tumors in a high percentage of animals of both the first and second hybrid generations shows that the susceptibility of this organ to tumor formation induced by the subcutaneous injections of a lard-dibenzanthracene solution is inherited in a dominant manner.

In both hybrid generations the carcinogenic compound produced subcutaneous tumors earlier in the male mice. It is essential to note that the females of the first hybrid generation were injected approximately 3 months after their brothers had received their initial injection. Furthermore, practically all the females had raised a litter before their injections began. Hence, the age at the time of injection or the influence of breeding may have been of some significance in the later appearance of tumors in the females of this generation. These factors, however, cannot be held responsible for the difference which occurred in the second hybrid generation, for all of these females were virgins and all were injected at the same time as their male litter mates. Previous experiments in this laboratory have not revealed any such difference in susceptibility between the sexes. The reason for the results obtained with these outcross animals remains obscure.

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DEATHS DURING WEEK ENDED FEBRUARY 20, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 20, 1937	Corresponding week, 1936
Data from 85 large cities of the United States:		
Total deaths	10,403	10,445
Average for 3 prior years	9,475	
Total deaths, first 7 weeks of year	74,766	67,022
Deaths under 1 year of age	656	617
Average for 3 prior years	586	
Deaths under 1 year of age, first 7 weeks of year	4,504	3,965
Data from industrial insurance companies:		
Policies in force	69,207,100	67,958,356
Number of death claims	16,541	14,938
Death claims per 1,000 policies in force, annual rate	12.5	11.5
Death claims per 1,000 policies, first 7 weeks of year, annual rate	11.6	10.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 27, 1937, and Feb. 29, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936
New England States:								
Maine			212	5	6	255	0	0
New Hampshire	1			1	76	13	0	0
Vermont						496	0	0
Massachusetts	4	8			768	916	4	12
Rhode Island	1				201	43	2	1
Connecticut	2	4	169	17	474	91	2	2
Middle Atlantic States:								
New York	31	51	[1] 45	[1] 78	439	2,636	11	27
New Jersey	9	16	134	62	1,190	159	6	7
Pennsylvania	45	41			219	797	7	6
East North Central States:								
Ohio	38	35	447	127	99	421	13	12
Indiana	9	27	133	48	11	40	3	1
Illinois	37	39	162	42	36	28	7	16
Michigan	16	7	4	10	52	44	2	4
Wisconsin	1	2	220	64	14	84	1	3
West North Central States:								
Minnesota	6	3	1	2	32	289	2	1
Iowa	2	15	8	6	2	4	0	3
Missouri	19	19	944	650	8	20	8	12
North Dakota	1	5	7	12	2		0	0
South Dakota	1	3	9	2			1	2
Nebraska	5	9	30		13	29	0	0
Kansas	9	15		32	6	12	0	3
South Atlantic States:								
Delaware	1		7		76	66	0	1
Maryland [2]	8	9	372	72	554	146	2	11
District of Columbia	10	22	28	2	75	25	1	7
Virginia	14	11			269	86	14	48
West Virginia	14	12	1,252	218	1	21	10	9
North Carolina	25	16	173	482	64	55	8	8
South Carolina [3]		3	1,346	1,509	54	12	2	16
Georgia [3]	8	6	1,262	1,819			3	9
Florida	9	8	35	33	5	6	0	2
East South Central States:								
Kentucky	13	16	493	80	248	73	17	42
Tennessee	11	14	844	338	10	52	10	0
Alabama [3]	37	28	1,546	2,383	26	5	8	1
Mississippi [2]	7	4					2	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 27, 1937, and Feb. 29, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936
West South Central States:								
Arkansas	11	3	980	140		2	3	3
Louisiana	12	15	389	78	8	51	2	3
Oklahoma [4]	7	10	974	256	12	13	7	10
Texas	29	15	3,480	655	310	418	14	5
Mountain States:								
Montana	2	1	132	45	2	16	0	1
Idaho	2		67	3	34	15	1	0
Wyoming		1	50		2	8	0	0
Colorado	6	4			6	9	1	2
New Mexico	4	9	167	8	62	18	0	1
Arizona	5	5	269	304	239	37	2	0
Utah [2]		1			26	1	0	1
Pacific States:								
Washington	4	1	5	4	43	261	0	1
Oregon	1	2	196	267	7	733	1	0
California	21	33	1,915	1,661	110	1,890	13	11
Total	498	548	18,507	11,515	5,886	10,396	180	307
First 8 weeks of year [5]	4,584	5,218	209,415	48,179	37,714	54,856	1,247	1,645

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936
New England States:								
Maine	0	1	15	14	0	0	0	0
New Hampshire	0	0	23	3	0	0	0	0
Vermont	0	0	10	19	0	0	0	1
Massachusetts	0	0	255	285	0	0	1	3
Rhode Island	0	0	56	35	0	0	0	0
Connecticut	0	1	88	89	0	0	2	1
Middle Atlantic States:								
New York	0	1	953	1,277	4	0	2	6
New Jersey	0	1	174	520	0	0	1	3
Pennsylvania	0	1	561	512	0	0	3	1
East North Central States:								
Ohio	1	0	493	491	7	0	3	5
Indiana	1	0	216	344	8	1	0	8
Illinois	1	0	582	969	40	6	4	2
Michigan	0	0	771	297	3	0	1	1
Wisconsin	0	0	349	615	4	15	1	0
West North Central States:								
Minnesota	0	0	169	372	2	3	1	1
Iowa	2	0	351	106	35	20	0	3
Missouri	0	0	292	219	46	17	0	2
North Dakota	0	0	47	124	22	17	1	0
South Dakota	0	0	73	62	5	31	1	1
Nebraska	0	0	106	238	0	23	0	0
Kansas	0	0	378	325	22	47	1	1
South Atlantic States:								
Delaware	0	0	4	9	0	0	1	0
Maryland [2]	0	0	51	98	0	0	1	3
District of Columbia	0	0	21	30	0	0	1	1
Virginia	0	1	35	57	0	0	1	2
West Virginia	0	0	55	44	0	1	3	1
North Carolina	1	1	33	34	0	0	8	0
South Carolina [3]	0	0	6	5	0	0	3	0
Georgia [3]	0	0	14	24	0	1	2	1
Florida	2	0	6	4	0	0	1	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 27, 1937, and Feb. 29, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936	Week ended Feb. 27, 1937	Week ended Feb. 29, 1936
East South Central States:								
Kentucky	0	1	65	76	0	0	2	0
Tennessee	0	0	18	24	0	0	4	1
Alabama [3]	2	3	12	30	0	0	1	5
Mississippi [2]	0	0	12	14	0	0	2	1
West South Central States:								
Arkansas	0	1	11	9	5	1	0	4
Louisiana	1	0	14	19	0	3	6	3
Oklahoma [4]	2	1	41	22	6	8	0	2
Texas	2	0	77	38	2	0	20	4
Mountain States:								
Montana	0	0	47	137	29	8	0	1
Idaho	0	0	25	92	1	4	0	1
Wyoming	0	0	36	127	3	1	0	0
Colorado	0	0	45	154	1	8	0	2
New Mexico	0	0	35	112	0	0	0	4
Arizona	0	0	16	34	0	2	1	2
Utah [2]	0	0	23	143	0	1	0	0
Pacific States:								
Washington	0	0	63	81	5	13	2	1
Oregon	1	1	23	34	24	1	0	0
California	0	3	219	410	9	1	1	4
Total	16	17	6,969	8,777	283	233	82	88
First 8 weeks of year [5]	181	141	50,571	60,128	2,364	1,688	885	786

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 27, 1937, 16 cases, as follows: South Carolina, 3; Georgia, 9; Alabama, 4.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Figures for 8 weeks ended Feb. 27, 1937, include delayed reports.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1937										
Arizona	10	16	3,333	3	602	-------	1	94	0	3
California	30	147	19,447	3	356	5	14	1,375	40	25
Kansas	8	43	14,943	-------	35	1	2	1,346	120	3
Mississippi	2	31	13,872	1,605	986	144	1	48	-------	21
Montana	9	12	10,600	-------	10	-------	0	221	61	5
North Dakota	6	3	956	-------	139	-------	0	260	145	1
Rhode Island	3	3	43	-------	663	-------	0	231	0	1
Vermont	-------	-------	215	-------	18	-------	0	39	0	8
Wisconsin	7	14	6,110	-------	84	-------	2	1,265	58	4

Summary of monthly reports from States—Continued

January 1937	Cases
Chicken pox:	
Arizona	263
California	3,415
Kansas	466
Mississippi	791
Montana	236
North Dakota	163
Rhode Island	238
Vermont	453
Wisconsin	2,362
Dengue:	
Mississippi	1
Dysentery:	
Arizona	6
California (amoebic)	6
California (bacillary)	13
Kansas (bacillary)	1
Mississippi (amoebic)	59
Mississippi (bacillary)	179
Montana (amoebic)	1
Encephalitis, epidemic or lethargic:	
California	4
Montana	2
North Dakota	1
Wisconsin	1
Food poisoning:	
California	41
German measles:	
Arizona	21
California	89
Kansas	6
Montana	13
Rhode Island	1
Vermont	12
Wisconsin	3
Granuloma, coccidioidal:	
California	4

January 1937—Continued	Cases
Hookworm disease:	
Mississippi	344
Impetigo contagiosa:	
Kansas	1
Montana	4
Jaundice, epidemic:	
California	2
Kansas	1
Leprosy:	
California	2
Mumps:	
Arizona	118
California	2,663
Kansas	739
Mississippi	825
Montana	296
North Dakota	234
Rhode Island	12
Vermont	134
Wisconsin	730
Ophthalmia neonatorum:	
California	2
Mississippi	5
Paratyphoid fever:	
California	1
Puerperal septicemia:	
Mississippi	20
Rabies in animals:	
California	106
Mississippi	30
Scabies:	
Kansas	4
Montana	2
Septic sore throat:	
Arizona	1
California	18
Kansas	3
Montana	17

January 1937—Continued	Cases
Septic sore throat—Contd.	
Rhode Island	1
Wisconsin	18
Tetanus:	
California	3
Rhode Island	1
Trachoma:	
Arizona	21
California	8
Mississippi	9
Montana	1
Tularaemia:	
California	1
Kansas	1
Wisconsin	1
Typhus fever:	
California	1
Undulant fever:	
Arizona	2
California	5
Kansas	5
Mississippi	1
Vermont	4
Wisconsin	1
Vincent's infection:	
Kansas	5
North Dakota	5
Whooping cough:	
Arizona	26
California	1,278
Kansas	107
Mississippi	289
Montana	19
North Dakota	4
Rhode Island	132
Vermont	115
Wisconsin	439

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 20, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	3	0	0	9	1	0	1	0	3	27
New Hampshire:											
Concord	0		3	0	4	2	0	0	0	0	14
Manchester	0		4	0	7	0	0	0	0	0	29
Nashua	0			0	7	0	0		0	0	
Vermont:											
Barre	0		1	0	0	1	0	1	0	6	2
Burlington	0		0	0	0	6	0	0	0	0	7
Rutland	0		0	0	3	1	0	0	0	0	11
Massachusetts:											
Boston	3		5	10	60	52	0	9	1	146	312
Fall River	2		0	10	8	3	0	1	0	2	43
Springfield	0		0	27	2	1	0	2	0	10	43
Worcester	0		0	187	11	6	0	3	0	36	66
Rhode Island:											
Pawtucket											
Providence	0	14	4	203	13	44	0	4	0	10	86
Connecticut:											
Bridgeport	0	9	2	43	6	18	0	2	0	0	43
Hartford	0	32	0	2	12	10	0	1	0	6	64
New Haven	1	17	1	0	3	5	0	0	0	0	60
New York:											
Buffalo	0		2	42	29	25	11	7	0	40	201
New York	48	74	14	151	168	457	0	98	4	112	1,617
Rochester	0	9	3	0	8	3	0	1	0	11	94
Syracuse	0		1	32	15	70	0	1	0	22	71

City reports for week ended Feb. 20, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Jersey:											
Camden	1		2	2	4	3	0	0	0	13	35
Newark	0	7	2	480	14	12	0	9	0	29	110
Trenton	0	6	2	2	6	6	0	4	0	0	54
Pennsylvania:											
Philadelphia	7	35	20	12	60	291	0	26	0	101	630
Pittsburgh	2	14	8	15	29	50	0	10	0	36	178
Reading	0		0	3	5	3	0	3	0	22	29
Scranton	1			0		19	0		0	3	
Ohio:											
Cincinnati	3	5	2	33	18	21	0	10	0	7	183
Cleveland	2	149	11	4	34	76	0	11	0	57	240
Columbus	2	119	13	3	12	11	0	10	0	0	128
Toledo	0	11	8	5	8	11	0	3	0	35	92
Indiana:											
Anderson	0		1	2	1	12	0	1	0	1	10
Fort Wayne	0		0	0	6	1	0	5	0	2	28
Indianapolis	0		5	1	28	45	0	5	0	22	119
South Bend	0		1	0	3	6	0	0	0	3	26
Terre Haute	1		0	0	0	3	0	0	0	0	38
Illinois:											
Alton	0		0	0	1	4	0	1	0	0	10
Chicago	13	29	4	14	82	243	0	33	2	83	800
Elgin	0		0	0	1	1	0	0	0	13	10
Moline	0		0	0	3	0	0	2	0	12	12
Springfield	0		1	0	6	4	0	0	0	6	22
Michigan:											
Detroit	9	4	3	8	32	449	0	18	0	91	277
Flint	1		1		3	22	0	0	0	3	32
Grand Rapids	0		1	8	2	15	0	1	0	17	48
Wisconsin:											
Kenosha	0		0	0	0	4	0	1	0	3	4
Madison	0		0	1	0	11	0	0	0	2	13
Milwaukee	0	3	3	2	15	72	0	4	0	21	138
Racine	0		0	0	1	6	0	0	0	0	12
Superior	0		1	1	1	3	0	0	0	5	14
Minnesota:											
Duluth	0		2	0	0	23	0	0	0	3	30
Minneapolis	1		0	2	20	26	0	1	0	21	109
St. Paul	1		0	1	7	15	0	2	0	42	61
Iowa:											
Cedar Rapids	0			0		2	0		0	0	
Davenport	0			0		3	0		0	2	
Des Moines	1			0		41	0		0	0	39
Sioux City	0			0		27	0		0	2	
Waterloo	0			0		23	0		0	9	
Missouri:											
Kansas City	1	7	4	4	6	84	0	1	0	4	101
St. Joseph	1		1	0	7	10	24	2	0	1	56
St. Louis	9		4	1	18	50	2	5	0	69	228
North Dakota:											
Fargo	0		0	1	0	8	0	0	0	0	3
Grand Forks	0			0		0	0		0	0	
Minot	0		0	0	0	0	1	0	0	0	9
South Dakota:											
Aberdeen	0			0		5	0		0	0	
Nebraska:											
Omaha	0		0	0	14	6	0	4	0	4	87
Kansas:											
Lawrence	0		0	0	2	0	0	0	0	0	5
Topeka	0		1	0	11	12	0	0	0	0	27
Wichita	0	2	2	2	7	10	0	1	0	0	33
Delaware:											
Wilmington	0		2	32	8	4	0	0	0	2	40
Maryland:											
Baltimore	8	35	4	362	51	17	0	15	0	63	278
Cumberland	0	1	1	0	8	0	0	0	0	0	14
Frederick	0		0	0	2	0	0	0	0	0	4
Dist. of Col.:											
Washington	5	27	10	63	34	23	0	14	1	18	220
Virginia:											
Lynchburg	1		1	3	3	0	0	2	0	2	15
Norfolk	0	23	0	0	9	5	0	0	0	0	34
Richmond	0		6	4	11	1	0	1	0	1	61
Roanoke	1		0	72	3	1	0	2	0	0	19

City reports for week ended Feb. 20, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
West Virginia:											
Charleston	0	9	0	0	8	1	0	1	0	0	25
Huntingdon	1	-	-	0	-	2	0	-	0	0	-
Wheeling	0	-	4	1	8	5	0	0	0	0	39
North Carolina:											
Gastonia	0	1	0	0	0	0	0	0	0	0	-
Raleigh	0	-	0	1	6	0	0	1	0	1	21
Wilmington	1	-	0	0	1	0	0	1	0	0	7
Winston-Salem	0	1	0	1	5	3	0	2	0	1	20
South Carolina:											
Charleston	1	174	4	0	4	2	0	0	2	0	31
Columbia	0	-	0	0	4	0	0	1	0	0	26
Florence	0	-	0	0	3	0	0	0	0	0	17
Georgia:											
Atlanta	1	443	9	0	12	1	0	3	0	2	98
Brunswick	0	1	1	0	0	0	0	0	0	0	5
Savannah	1	120	2	0	4	2	0	5	0	3	40
Florida:											
Miami	1	12	1	2	1	2	0	2	0	1	39
Tampa	3	2	1	1	1	2	0	1	0	0	22
Kentucky:											
Ashland	0	30	0	0	3	0	0	0	0	0	11
Covington	0	-	1	0	1	0	0	1	0	0	18
Lexington	0	4	4	12	7	1	0	2	0	0	26
Tennessee:											
Knoxville	3	9	5	3	6	3	0	2	0	2	37
Memphis	0	-	20	1	29	0	0	7	0	34	146
Nashville	0	-	4	0	7	3	0	3	0	4	65
Alabama:											
Birmingham	2	201	9	0	7	5	0	4	0	5	75
Mobile	0	15	5	0	9	0	0	3	1	0	39
Montgomery	1	6	-	0	-	1	0	-	0	0	-
Arkansas:											
Fort Smith	0	-	-	0	-	4	0	-	0	0	-
Little Rock	0	-	1	0	14	1	0	8	0	0	25
Louisiana:											
Lake Charles	1	-	0	0	2	0	0	0	0	0	-
New Orleans	9	75	10	0	35	2	0	12	0	0	192
Shreveport	0	-	2	0	10	0	0	2	1	0	43
Oklahoma:											
Muskogee	0	-	-	0	-	2	0	-	0	0	-
Tulsa	0	-	-	0	-	5	0	-	0	9	-
Texas:											
Dallas	4	24	24	8	19	13	0	3	0	11	115
Fort Worth	0	-	3	78	10	1	1	3	0	1	54
Galveston	0	-	0	0	7	1	0	0	0	0	33
Houston	2	-	3	0	26	1	0	4	1	0	98
San Antonio	0	-	15	7	17	0	0	9	0	1	100
Montana:											
Billings	0	-	0	0	1	1	0	0	0	0	7
Great Falls	0	-	3	0	5	0	1	0	0	0	11
Helena	0	72	0	17	3	18	0	0	0	0	5
Missoula	0	-	0	0	2	1	0	0	0	0	8
Idaho:											
Boise	0	-	0	0	1	0	0	1	0	0	10
Colorado:											
Colorado Springs	0	-	1	0	2	12	0	1	0	0	[illegible]
Denver	0	-	3	6	7	11	0	8	0	45	93
Pueblo	1	-	0	1	2	1	0	0	0	0	7
New Mexico:											
Albuquerque	0	38	0	0	0	6	0	3	0	9	9
Utah:											
Salt Lake City	2	-	1	8	6	10	0	0	0	8	41
Nevada:											
Reno	-	-	-	-	-	-	-	-	-	-	-
Washington:											
Seattle	0	-	4	1	12	5	0	5	0	3	111
Spokane	0	4	4	0	8	3	0	0	0	4	45
Tacoma	1	-	2	0	4	6	0	0	0	0	43
Oregon:											
Portland	0	6	4	2	8	7	3	0	0	2	85
California:											
Los Angeles	13	155	18	24	75	35	0	29	0	65	490
Sacramento	1	134	3	1	7	5	0	3	0	1	41
San Francisco	8	87	10	1	14	31	0	9	0	20	210

City reports for week ended Feb. 20, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Maryland:			
Boston	3	2	0	Baltimore	4	2	0
Rhode Island:				District of Columbia:			
Providence	1	0	0	Washington	2	1	0
New York:				Georgia:			
New York	9	5	0	Atlanta	1	0	0
Rochester	1	0	0	Kentucky:			
Syracuse	1	1	0	Ashland	1	0	0
Pennsylvania:				Louisville	4	5	0
Philadelphia	1	1	0	Alabama:			
Pittsburgh	2	0	0	Birmingham	1	0	0
Ohio:				Arkansas:			
Cincinnati	2	1	0	Little Rock	0	2	0
Cleveland	1	0	0	Texas:			
Illinois:				Dallas	1	0	0
Chicago	2	0	0	Fort Worth	2	1	0
Michigan:				Galveston	1	0	0
Detroit	1	0	0	Houston	3	0	0
Flint	1	1	0	Montana:			
Minnesota:				Billings	1	0	0
Minneapolis	1	1	0	Colorado:			
St. Paul	1	0	0	Denver	2	1	0
Missouri:				California:			
St. Louis	2	1	0	Los Angeles	2	5	1
Kansas:				Sacramento	1	0	0
Wichita	1	0	0	San Francisco	2	0	0

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Philadelphia, 1; Flint, 1; Washington, D. C., 1; Louisville, 1.

Pellagra.—Cases: Baltimore, 1; Winston-Salem, 2; Charleston, S. C., 1; Savannah, 2; Birmingham, 1; Mobile, 1; Los Angeles, 1; San Francisco, 1.

Rabies in man.—Deaths: Atlanta, 1.

Typhus fever.—Cases: New York, 2; Savannah, 3; Miami, 2.

FOREIGN AND INSULAR

AUSTRIA

Vital statistics—1935.—The following table shows the number of marriages, births, and deaths in Austria for the year 1935:

Population	[illegible], 631	Deaths from—Continued.	
Marriages	45, 375	Influenza	1, 404
Births	91, 111	Malaria	6
Total deaths	92, 390	Measles	163
Deaths from:		Scarlet fever	103
Accidents	2, 313	Sepsis	913
Cancer and other malignant tumors	11, 854	Suicide	2, 506
Congenital debility	1, 807	Syphilis	406
Diabetes	783	Tuberculosis	7, 343
Diphtheria	902	Typhoid fever and paratyphoid fever	121
Heart disease	15, 365	Whooping cough	209

CUBA

Habana—Communicable diseases—4 weeks ended February 13, 1937.—During the 4 weeks ended February 13, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	17	1	Poliomyelitis	[1] 2	
Leprosy	1		Scarlet fever	1	
Malaria	[1] 34	3	Tuberculosis	14	3
Measles		1	Typhoid fever	[1] 40	4

[1] Includes imported cases.

GERMANY

Vital statistics—Third quarter 1936.—Following are vital statistics for Germany for the third quarter of 1936:

Number of marriages	147, 055	Number of deaths	172, 394
Number of marriages per 1,000 population	8. 7	Number of deaths per 1,000 population	10. 2
Number of births	312, 162	Deaths under 1 year of age	18, 824
Number of births per 1,000 population	18. 5	Deaths under 1 year of age per 100 live births	5. 9
Number of stillbirths	7, 739		

ITALY

Vital statistics—1936.—Following are vital statistics for Italy for the year 1936:

Number of marriages	310, 822	Number of live births per 1,000 population	22. 2
Number of marriages per 1,000 population	7. 2	Total deaths	582, 612
Number of live births	955, 189	Deaths per 1,000 population	13. 5

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for February 26, 1937, pages 255-267. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued March 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India—Bassein.—During the week ended February 20, 1937, 4 cases of cholera were reported in Bassein, India.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—A rat found March 1, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been proved plague infected.

Smallpox

Siam—Tak Province.—During the week ended February 20, 1937, 26 cases of smallpox were reported in Tak Province, Siam.

Typhus Fever

Trans-Jordan—Kerak District.—During the week ended February 20, 1937, 3 cases of typhus fever were reported in Kerak District, Trans-Jordan.

Yellow Fever

Gold Coast—Accra.—On February 10, 1937, 2 cases of yellow fever were reported at Accra, Gold Coast.

Ivory Coast.—During the week ended February 20, 1937, yellow fever was reported in Ivory Coast as follows: 3 cases in Adzope, Agneby Circle, and 1 suspected case in Nzimcomoe Circle.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

January 31–February 27, 1937

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—Influenza was epidemic in various sections of the country throughout the months of January and February. The largest number of cases, for all States, was reported during the week of January 24–30, approximately 37,000, a weekly excess of 35,000 over the nonepidemic year of 1934. The number of reported cases of influenza decreased in February in every section of the country, except the East South Central area, where there has been a gradual increase. In all States combined the number of reported cases has dropped from approximately 32,000 for the first week of February to 15,000 for the week of February 28–March 6. The seasonal expectancy for the latter week is approximately 3,500.

Reports of deaths from influenza and pneumonia in the total of 95 large cities show the peak week of mortality to have been January 3–9. Since January 9 the mortality from influenza and pneumonia has slowly declined, but for the week ended February 27 it was still somewhat above the normal expectancy for all cities combined. In the Middle Atlantic, East North Central, West North Central, and Mountain sections of the country the peak week of mortality occurred during the first half of January, and by the end of February mortality from influenza and pneumonia in these areas had dropped practically

[1] From the Office of Statistical Investigations, U. S. Public Health Service. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 46; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

to seasonal expectancy. In the New England, the three Southern sections, and on the Pacific coast, however, mortality from influenza and pneumonia continued to rise during January and February. In the Pacific areas the peak of mortality occurred during the week of February 7–13, in the New England, South Atlantic, and West South Central regions during the week of February 13–20, and in the East South Central area during the last week for which data are available, February 21–27.

The maximum weekly excess mortality from influenza and pneumonia (Jan. 3–9) for all cities was 146 per 100,000, or about the same as that of the winter of 1932–33. In the various regions the excess of the peak week over the corresponding week of 1934 varied from 101 per 100,000 in the East North Central to 747 per 100,000 in the Mountain region. The West South Central, East South Central, Pacific, and Mountain regions showed the largest excesses, 361, 407, 454, and 747 per 100,000, respectively.

Mortality from all causes (86 large cities) likewise shows an excess in each section of the country during January or February. In each area the rates for the week of February 28–March 6 (one week later than that for which data for influenza and pneumonia are available) are about what would be expected for this season of the year.

Smallpox.—For the country as a whole smallpox remained at a relatively high level. The geographic distribution, however, remained strikingly uneven. Of the total of 1,220 cases reported for the 4 weeks ended February 27, the West North Central region reported 689, the Mountain and Pacific regions, 274, the East North Central region, 196, and the South Central regions, 45. The North Atlantic regions reported 11 cases, all in New York, and the South Atlantic, only 5 cases. The disease has been most prevalent in the Mountain, Pacific, and North Central regions continuously since the beginning of 1935. Not all of the States in those regions, however, have contributed to the rise. In the former regions, Montana, Oregon, Washington, and Colorado have reported the highest incidence, while in the latter region all States, except Ohio and Indiana, have reported considerable increases over preceding years.

While the current incidence is the highest in 5 years, it is considerably below that for the corresponding period in 1931, 1930, and 1929, when 4,147, 6,647, and 3,930 cases, respectively, were reported.

Meningococcus meningitis.—For the current 4-week period 678 cases of meningococcus meningitis were reported, about 85 percent of the number for the corresponding period in 1936; exclusive of that year, the current incidence was the highest for this period since 1930. In the North Central regions the incidence was about normal, but in other regions the numbers of cases were considerably above the average for the season.

Number of cases of influenza and death rates from influenza and pneumonia and from all causes in each geographic area, by weeks, from Jan. 31 to Mar. 6, 1937 [1]

Regions	Week ended—														
	Feb. 6	Feb. 13	Feb. 20	Feb. 27	Mar. 6	Jan. 30	Feb. 6	Feb. 13	Feb. 20	Feb. 27	Feb. 6	Feb. 13	Feb. 20	Feb. 27	Mar. 6
	Number of reported cases in States					Death rate (annual basis) from influenza and pneumonia in 95 large cities, per 100,000 population					Death rate (annual basis) from all causes in 86 large cities per 1,000 population				
All regions: [2]															
1937	32,369	27,281	21,931	18,507	15,134	269	253	265	250	224	14.4	14.6	14.5	13.8	13.3
1934 [3]	2,714	2,819	3,825	3,683	3,341	147	148	149	170	171	12.3	12.4	13.8	12.9	13.0
New England:															
1937	2,231	994	880	381	132	291	281	345	357	274	17.4	18.4	17.8	16.0	15.7
1934	6	24	6	9	30	148	162	200	234	211	13.5	14.1	16.4	15.2	14.2
Middle Atlantic:															
1937	236	104	184	179	123	218	186	172	172	163	13.1	12.8	13.3	13.2	12.9
1934	56	47	47	39	60	138	138	137	165	178	12.0	12.2	14.1	12.6	13.6
East North Central:															
1937	1,849	2,365	941	966	388	173	181	185	170	157	12.2	12.2	12.6	11.7	11.6
1934	301	236	329	346	284	107	120	122	120	134	11.2	10.8	11.6	11.4	10.8
West North Central:															
1937	4,747	2,618	1,040	999	507	452	338	300	236	218	15.2	13.4	13.7	13.6	12.7
1934	73	97	336	261	226	250	177	163	241	174	13.4	13.4	13.0	13.1	13.5
South Atlantic:															
1937	3,421	4,045	3,583	4,475	3,987	333	377	354	415	368	17.9	18.8	17.9	18.9	17.7
1934	1,211	943	1,232	1,271	1,016	215	225	223	225	199	15.4	15.2	17.3	16.5	16.0
East South Central:															
1937	1,334	2,133	2,425	2,883	3,376	255	376	470	624	698	17.8	19.2	19.8	18.5	18.5
1934	326	526	436	473	430	251	257	264	379	291	14.5	15.0	19.3	15.3	15.0
West South Central:															
1937	6,592	6,242	6,475	5,823	5,000	368	411	559	606	507	17.4	17.5	18.3	16.1	15.2
1934	609	791	1,275	1,094	1,101	205	202	218	245	262	13.8	14.8	15.4	14.8	14.1
Mountain:															
1937	2,656	1,912	974	685	324	680	468	415	300	229	16.8	18.9	15.7	14.7	15.6
1934	61	71	73	90	43	163	163	121	155	164	16.0	11.6	15.6	13.4	18.2
Pacific:															
1937	9,303	6,868	4,529	2,116	1,297	512	423	539	302	222	17.9	19.8	17.0	14.5	12.6
1934	71	84	91	100	151	104	113	85	93	104	12.4	12.0	12.5	12.1	11.5

[1] For similar tables see PUBLIC HEALTH REPORTS for Jan. 15, 1937, p. 68; Jan. 29, p. 126; Feb. 12, p. 190; and Feb. 19, p. 210.
[2] No reports were received from Mississippi, Nevada, up-State New York, Pennsylvania, and Virginia. New York City is included.
[3] Reported cases for the corresponding weeks of 1934, the winter of 1933–34 being one of average influenza incidence.

Poliomyelitis.—While the number of cases of poliomyelitis (80) was about 20 percent in excess of that reported for this period in 1936, the incidence was at approximately the average level of recent years. The South Atlantic and South Central regions (18 and 35 cases, respectively) represented the areas of highest incidence for this period in the 9 years for which these data are available. In other regions the incidence was about normal for the season. The lowest level of poliomyelitis is usually reached during March or April.

Scarlet fever.—The seasonal increase of scarlet fever continued during the 4 weeks ended February 27. The number of cases (26,877) was, however, about normal in relation to the seasonal expectancy. Each geographic region shared in this favorable situation.

Measles.—For the entire reporting area the incidence of measles was the lowest in recent years. The number of cases, 20,878, was about 40 percent less than normal. The current incidence compares very favorably with the more than 90,000 cases for the comparable period in each of the years 1934 and 1935, when measles was unusually prevalent. In the South Atlantic and South Central regions the disease was more prevalent than during the corresponding period in 1936, but in all other regions the incidence was the lowest in recent years.

Typhoid fever.—The number of cases of typhoid fever reported for the 4 weeks ending February 27 was 390, as compared with 364, 521, and 619 for the corresponding period in each of the three preceding years, regressively. The South Atlantic and South Central regions reported slight increases over the corresponding period in 1936; the West North Central and Mountain and Pacific reported decreases, and in the North Atlantic and East North Central regions the incidence closely approximated that of last year.

Diphtheria.—The incidence of diphtheria was the lowest for this period in the 9 years for which these data are available. For the 4 weeks ended February 27 the number of cases totaled 2,069, as compared with 2,369, 2,874, and 3,381 for the corresponding period in the years 1936, 1935, and 1934, respectively. In regions along the Atlantic coast the incidence stood at about the level of the two preceding years, but other regions continued to report a decline with the lowest numbers of cases for this period in recent years.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended February 27, based on data received from the Bureau of the Census, was 14.3 per 1,000 inhabitants (annual basis). The rates for this period in 1936, 1935, and 1934 were 13.8, 12.6, and 12.7, respectively. The presence of a minor influenza epidemic with a relatively high death rate from influenza and pneumonia was no doubt responsible for the slightly higher current rate, 1.3 per 1,000 over the average for the 3 preceding

years. The peak rate of 15.8 occurred in the week ended January 9, with a decline to 13.8 for the week ended February 27.

SOME ASPECTS OF BLANKET COVERAGE OF OCCUPATIONAL DISEASES IN THE UNITED STATES[1]

Workmen's compensation acts as originally adopted by the various States concerned themselves primarily with accidents and made little or no provision for occupational disease. At the time of the writing of these acts it was known that, in a number of employments, disabilities and deaths resulted not only from accidents but also from diseases associated with certain occupations. A situation has developed in which the workmen's compensation laws of the different States are not uniform and vary greatly in the provisions they contain. Thus, in a few States all occupational diseases come under workmen's compensation laws, in other States only certain specified diseases, and in the greater number of States no diseases at all come under compensation.

BLANKET COVERAGE

At the present writing, eight States, namely, California, Connecticut, Illinois, Massachusetts, Missouri, New York, North Dakota, and Wisconsin, have workmen's compensation acts that cover occupational diseases generally. Blanket coverage for diseases is also provided by three Federal laws administered by the United States Employees' Compensation Commission. These laws deal with compensation for (1) civil employees of the United States who suffer personal injury while in the performance of official duty, (2) disability or death resulting from injury to certain employees in maritime employment upon the navigable waters of the United States, and (3) disability or death resulting from injury to employees in certain employments within the District of Columbia.

Whether a State shall adopt blanket coverage or a limited number of compensable diseases listed in a schedule is still a subject of controversy. It is frequently stated that any system other than blanket coverage is unfair, unjust, illogical, and ineffective. In this connection the following may be quoted: "Far from embodying the wealth of available information on disease hazards in industry, the schedules have served, rather, as a means of giving protection only where forced to give it, and of denying it where there was no insistent demand at the moment for the additional listing. Additions to the schedule list have been conceded only after some individual case which has gone unpro-

[1] From the Office of Industrial Hygiene and Sanitation, U. S. Public Health Service Presented at the tenth meeting of the Correspondence Committee on Industrial Hygiene, International Labor Office, Sept 21–23, 1936, Geneva, by L. R. Thompson, Assistant Surgeon General, Chief, Division of Scientific Research, U. S. Public Health Service.

tected has been given such wide publicity that public indignation has been aroused to the point where amendment was forced" (*1*). On the other hand, the opponents of complete coverage state that with laws having no schedules the advantage of prompt payment of compensation is often lost, and that confusion frequently arises through legal and other entanglements. In the matter of the additional cost necessitated in changing from no coverage to blanket coverage, casualty insurance rate makers have stated (*2*) that the change would involve not more than 1 percent increase in the rates of a State that already has a compensation law but without occupational disease coverage; the increase from a schedule to blanket coverage would, of course, be less.

In a report of this limited length it would be impossible, obviously, to present details concerning blanket coverage for all of the States in which it is operating. In no other State has a workmen's compensation act been operating longer than in Wisconsin, where it became effective in 1911. Eight years later, in 1919, occupational diseases in the form of blanket coverage were included in the act. In the following are presented excerpts from the law and some of the results of the all-coverage system in Wisconsin.

THE LAW PERTAINING TO COMPENSATION FOR OCCUPATIONAL DISEASE IN WISCONSIN (*3*)

(A) *Definitions.*—"Injury" is mental or physical harm to an employee caused by accident or disease. "Date of onset of disease" is the last day of work for the last employer whose employment caused disability. [The law as to occupational disease is now such that compensation benefits may be recovered for disability which occurs subsequently to the severance of the employer-employee relationship, even though there was neither wage loss nor time loss during the time that the employee was in service. Previous construction of the court had made it necessary to establish actual wage loss or time loss during the period of employment as a condition precedent to recovery.]

(B) *Conditions of liability.*—(1) Liability shall exist against an employer only where the following five conditions occur: (*a*) Where the employee sustains an injury. (*b*) Where, at the time of the injury, both the employer and employee are subject to the provisions of this chapter. (*c*) Where, at the time of the injury, the employee is performing service growing out of and incidental to his employment. Every employee going to and from his employment in the ordinary and usual way, while on the premises of his employer, shall be deemed to be performing service growing out of and incidental to his employment; and so shall any fireman responding to a call for assistance outside the limits of his city or village, unless such response is in violation of law. (*d*) Where the injury is not intentionally self-inflicted. (*e*) Where the accident or disease causing injury arises out of his employment. [Prior to this provision the courts had held that it was not necessary in order to collect a compensation that an injury or disease should bear causal relation to employment.]

(2) Where such conditions exist, the right to the recovery of compensation pursuant to the provisions of this chapter shall be the exclusive remedy against the employer.

(3) In the case of disease, intermittent periods of temporary disability shall create separate claims, and permanent partial disability shall create a claim separate from a claim for any subsequent disability which latter disability is the result of an intervening cause.

(C) *Incidental compensation.*—(1) *Treatment.*—The employer shall supply such medical, surgical and hospital treatment, medicines, medical and surgical supplies, crutches, artificial members and appliances, or, at the option of the employee, if the employer has not filed notice as hereinafter provided, Christian Science treatment in lieu of medical treatment, medicines and medical supplies, as may be reasonably required for 90 days immediately following the injury to cure and relieve from the effects of the injury, and for such additional period of time as in the judgment of the commission will tend to lessen the period of compensation disability, or in the case of permanent total disability for such period of time as the commission may deem advisable, not to exceed the period for which indemnity is payable, and in case of his neglect or refusal seasonably to do so, the employer shall be liable for the reasonable expense incurred by or on behalf of the employee in providing the same.

(2) *Physician, selection.*—The employee shall have the right to make choice of his attending physician from a panel of physicians to be named by the employer. Where the employer has knowledge of the injury and the necessity for treatment, his failure to tender the same shall constitute such neglect or refusal. Failure of the employer to maintain a reasonable number of competent and impartial physicians, ready to undertake the treatment of the employee, and to permit the employee to make choice of his attendant from among them, shall constitute neglect and refusal to furnish such attendance and treatment. The commission may upon summary hearing permit an injured employee to make selection of a physician not on the panel.

(3) *Medical panel.*—In determining the reasonableness of the size of the medical panel, the commission shall take into account the number of competent physicians immediately available to the community in which the medical service is required, and where only one such physician is available, the tender of attention by such physician will be construed as a compliance with this section unless specialized or extraordinary treatment is necessary. The employer shall not be required to maintain a panel of more than five physicians. In such panel, partners and clinics shall be deemed as one physician. Every employer shall post the names and addresses of the physicians on his panel in such manner as to afford his employees reasonable notice thereof.

(4) *Prejudiced physician.*—Whenever in the opinion of the commission a panel physician has not impartially estimated the degree of permanent disability or the extent of temporary disability of any injured employee, the commission may cause such employee to be examined by a physician selected by it, and to obtain from him a report containing his estimate of such disabilities. If the report of such physician shows that the estimate of the panel physician has not been impartial from the standpoint of such employee, the commission may in its discretion charge the cost of such examination to the employer, if he is a self-insurer, or to the insurance company which is carrying the risk.

(5) *Christian Science treatment.*—Any employer may elect not to be subject to the provisions for Christian Science treatment provided for in this section by filing written notice of such election with the commission.

(6) *Artificial members.*—Artificial members furnished at the end of the healing period need not be duplicated.

(7) *Treatment rejected by employee.*—No compensation shall be payable for the death or disability of an employee if his death be caused by or insofar as his disa-

bility may be aggravated, caused, or continued by an unreasonable refusal or neglect to submit to or follow any competent and reasonable surgical treatment.

RESULTS OF BLANKET COVERAGE IN WISCONSIN

In discussions of blanket coverage the question of the relationship of occupational diseases to all injuries immediately arises. More specifically, it is asked, "What percent of all compensated injuries is due to occupational diseases?" and, "What percent of all costs is represented by occupational diseases?" In Wisconsin during the 10-year period 1920–29, we find that the total number of compensated cases, that is, all injuries, including occupational diseases, was 200,791; of this number, 3,019, or 1.5 percent, were listed as occupational diseases. During the calendar year 1929 there were 22,630 compensated cases, of which 414, or 1.8 percent, were occupational diseases (*4*).

Respecting the relationship of occupational-disease costs to all costs, reference will be made to the experience of Wisconsin for the period 1920–33. During these 14 years a total of $59,595,901 was paid for all industrial cases; of this total, $1,423,569, or less than 2.4 percent, were paid for occupational diseases. "In the tabulation of occupational-disease statistics the Wisconsin Industrial Commission has included the cost figures for those types of occupational disease that under the law of that State and of most States are rated as accidental. For example, compressed-air illness, carbon-monoxide poisoning, typhoid fever, sunstroke, freezing, and ivy, oak, hemlock, and similar poisoning are usually compensable regardless of legislation covering occupational disease. This group of disease cases usually produces from 30 to 40 percent of the total cost, so that the Wisconsin experience, for cases depending on the blanket provision for relief, cost materially less than 2 percent of the whole" (*5*).

It is illuminating to compare the foregoing Wisconsin data with those published by the United States Employees' Compensation Commission which was established in 1916 to administer the civil employees' compensation act. In 1927 and 1928, respectively, this commission was charged with the duty of administering, in addition, the maritime compensation act and the District of Columbia compensation act. It was seen that in Wisconsin less than 2 percent of all the compensated cases were listed as occupational diseases; the annual reports of the United States Employees' Compensation Commission disclose the corresponding percents to vary from 1.5 to 3. With regard to the ratio of occupational-disease benefits to all industrial benefits, the Wisconsin data showed less than 2 percent, while an annual Federal report (*6*) states that the cost of cases due to occupational diseases or nonaccidental causes cannot "be accurately estimated but it is safe to say that during this entire period (1916–22)

the cost has not exceeded 3 percent of the entire benefits paid under the compensation act."

Available data (*4*) make it possible to present material on occupational diseases compensated in Wisconsin during the years 1920–29. This material concerns (1) proportionate incidence, (2) proportionate indemnity paid, and (3) average indemnity per case. During the 10 years there were 3,019 cases of occupational disease that were compensated; of this number approximately 100 resulted in death or in permanent disability, and the remaining cases were classified as temporary injuries. Confining ourselves to hazards that were believed to be associated with 10 or more percent of the total cases, we find that the largest number, namely, 840 cases, or 27.8 percent of the total, were related to toxic fluids, 396 cases (13.1 percent) to irritant dusts and fibers, 353 cases (11.7 percent) to toxic vapors, gases, and fumes, and 320 cases (10.6 percent) to miscellaneous irritants. This order with respect to proportionate incidence is not necessarily the same as the order of the hazards when arranged according to the amount of indemnity paid. A total of $575,052 was paid in the case of all occupational diseases.

Hazards that necessitated the expenditure of 10 or more percent of the total indemnity paid may be written in decreasing order of magnitude as follows: Toxic vapors, gases, and fumes (25.4 percent), irritant dusts and fibers (20.5 percent), and "germs" (11.3 percent). Of considerable interest is the average indemnity paid per case. The average for all occupational disease hazards was $191. When the hazards referred to above are arranged in decreasing order of magnitude with respect to the average indemnity paid per case, they read as follows: Toxic vapors, gases, and fumes ($414), "germs" ($322), irritant dusts, and fibers ($298), toxic fluids ($52), and miscellaneous irritants ($47).

SUMMARY

This report on blanket coverage of occupational diseases in the United States may be conveniently summarized as follows:

(1) The workmen's compensation laws of the different States are not uniform.

(2) Eight States have blanket coverage: California, Connecticut, Illinois, Massachusetts, Missouri, New York, North Dakota, and Wisconsin. In addition, blanket coverage is provided by three Federal laws.

(3) The question of whether a schedule or blanket coverage shall be adopted is controversial.

(4) Casualty insurance rate makers report that a change from no coverage to blanket coverage, in the case of a State with compensation laws but without occupational disease coverage, means not more than one percent increase in the rates.

(5) Opponents of complete coverage state that with laws having no schedules the advantage of prompt payment of compensation is often lost.

(6) Excerpts from the Wisconsin law pertaining to occupational disease are presented.

(7) Some results of blanket coverage for Wisconsin are given and in some instances compared with data published by the United States Employees' Compensation Commission.

REFERENCES

(1) Wilcox, F. M.: Quoted by Dodd, W. F. (1936): Administration of Workmen's Compensation. New York (The Commonwealth Fund). Pp. 765–766.
(2) Andrews, J. B. (1929): Occupational disease compensation. Presented at convention American Public Health Association. (Author's reprint.)
(3) Industrial Commission of Wisconsin [1936]: Workmen's Compensation Act with 1935 amendments. [Madison] (N. pub.). P. 2, pp. 29–31.
(4) Committee on Research and Standards, American Public Health Association [1931]: Report of Committee on Standard Practices in the Problem of Compensation of Occupational Diseases. Short title: Occupational Disease Legislation. N. p. (Published for the American Public Health Association by the Chemical Foundation.) P. 96.
(5) Wilcox, F. M.: Quoted by Dodd. P. 762.
(6) United States Employees' Compensation Commission (1923): Seventh Annual Report, July 1, 1922, to June 30, 1923. Washington (Government Printing Office). P. 131.

COCCIDIOIDAL GRANULOMA

In 1931 the California Department of Public Health issued Special Bulletin No. 57 dealing with the early history, etiology, and symptomatology of coccidioidal granuloma in California. In this bulletin it was pointed out that a fungus [1] is the causative agent of the disease, the clinical and pathological manifestations of which closely resemble tuberculosis and blastomycosis.

Coccidioidal granuloma has been described by Ormsby [2] as a systemic infection in which cutaneous manifestations occur in a minor number of instances. The disease attacks the pulmonary, osseous, cerebrospinal, and cutaneous systems in the order named. However, all tissues of the body except those of the gastrointestinal tract may be affected. The cutaneous lesions are not characteristic and may be primary or secondary. Papules, nodules, pustules, vegetating papillomas, and verrucous lesions are all seen. The secondary lesions consist of subcutaneous nodules, tumors, abscesses, and cutaneous ulcers.

The first human cases of coccidioidal granuloma were reported from Buenos Aires in 1892 and from California in 1894. Prior to

[1] *Coccidioides immitis*, a doubly contoured organism having a refractile capsule and developing in the tissues by endogenous spore formation.

[2] Oliver S. Ormsby: Diseases of the Skin, Lea and Febiger, 1934.

June 1, 1931, a total of 286 cases had been reported. Summarizing the epidemiology of the disease, Beck [3] reached the following conclusions:

1. Coccidioidal granuloma is a disease of both man and animal.
2. The infection has been demonstrated in 20 animals and 286 human cases have been reported up to 1931.
3. Geographically, the records show a concentration in central and southern California.
4. The majority of cases have occurred in males between 25 and 55 years of age.
5. The highest percentage of cases falls in the agricultural class involving contact with soil and its products.
6. The impression is that infection in both man and animal is probably contracted through inhalation, and there is evidence that humans are infected through the skin as the result of injuries.
7. No man-to-man, animal-to-animal, or animal-to-man transmission has ever been observed.
8. Soil and vegetation suggest the most probable source of infection.

The California Department of Public Health has recently issued another report [4] on coccidioidal granuloma, bringing the data for that State up to 1936. Up to July 1, 1936, 450 cases with 224 deaths have been recorded in the State. These figures indicate a high mortality rate. The observation is made that the epidemiology of the disease remains the same as when the subject was discussed in the special bulletin issued in 1931. Three hundred and one cases, or 66.8 percent of the 450 cases recorded, were from Fresno, Kern, Kings, Tulare, and Los Angeles Counties. The northern rural counties have never reported cases; the disease apparently has certain geographic limits.

A study of the cases according to age and sex shows that males are more often affected than females, 384 cases, or 85 percent, occurring in males, and the majority of the cases fall in the higher age groups, a total of 275, or 61 percent, occurring in persons between the ages of 25 and 55 years.

Of the total number of cases reported, 65.5 percent were recorded in the groups engaged in outside work or work involving contact with soil, vegetation, and animals and general outdoor labor. The theory that the disease is soil borne is probably correct, since Stewart and Meyer isolated the fungus (*Coccidioides immitis*) from soil samples collected in Kern County.

[3] M. Dorothy Beck: Coccidioidal granuloma—Epidemiology Special Bulletin No 57, California Department of Public Health, 1931.

[4] Coccidioidal granuloma, 1934-1935. Weekly Bulletin, California Department of Public Health, vol. 16, no. 2, p 6, Feb. 6, 1937.

Practically all races are affected, and the proportions have remained quite constant since the first tabulation in 1931. However, there have been slight variations, the percentage of foreign-born whites having decreased slightly while the percentage of Filipinos affected has doubled during the past 5 years.

Early diagnosis of pulmonary cases and differential diagnosis from tuberculosis by sputum examinations have been helpful in establishing the presence of the disease.

YELLOW FEVER ON SHIPBOARD

(Condensed from the note of Dr. P. G. Stock presented by the delegate from Great Britain to the Office International D'Hygiene publique at the October (1936) meeting of the Permanent Committee.)

The S. S. *Sea Rambler* arrived in the River Tyne, England, from Dakar, French West Africa, on September 12, 1936, with a record of 14 cases of severe illness, with 7 deaths, having occurred among members of the crew of 24.

After 8 days of loading cargo at Kaolakh and Zighinchor (July 31 to Aug. 7), the steamer sailed from Dakar on August 9. While at Zighinchor the weather had been extremely hot, and the mosquitoes are stated to have been "very bad."

Four days after the ship had departed for England, one of the firemen was stricken with a severe illness, accompanied by high fever and a slow pulse. The following day (Aug. 14) another fireman was similarly affected. The illness of the first officer, who refused to go off duty, is also thought to have started about this time, although the fact that he had a fever was not discovered until several days later. On August 17, after the steward and three sailors had become ill, the captain decided to call at Madeira for medical advice. During the next 2 days, 2 more firemen, the boatswain, and another sailor reported sick, all having temperatures ranging from 101° to 104° and pulse rates from 70 to 93.

Three of the sick men were removed to a hospital in Madeira on August 20. On the same day, the fireman whose illness started on August 14 collapsed on board ship and died, and the captain and another sailor became ill. On August 21, following the death on board ship of one of the men who had reported sick on August 17, the captain and five other members of the crew were removed to the hospital on shore, where the fireman whose illness commenced on August 19 died on August 24. It was not until August 26 that the fireman who was first taken ill on August 13 was removed to the hospital, the only cases then remaining on ship being the first officer (acting captain), who refused hospital treatment, and the cook, who was only slightly ill.

On August 29 the vessel was given her clearance from Madeira, and having signed on 3 sailors, 4 firemen, and a steward, sailed for England with only half of her original crew. (After the ship left Madeira, 4 of the patients who had been transferred to the hospital died; the others were sent to England as they recovered.) Upon the arrival of the vessel in the River Tyne on September 12, 7 members of her original crew of 24 had died, 5 were in hospital at Madeira, and 2 of the remaining 12 had been ill but had remained on duty.

While the illness had been diagnosed at Funchal as some form of food poisoning, the history available when the vessel reached the River Tyne suggested the possibility of yellow fever, and the port medical officer of health arranged for the examination, by protection tests on mice, of samples of blood collected from the members of the crew arriving on the vessel and from those who later returned to England after having been discharged from the hospital in Madeira. Of 14 such samples examined, 6 gave a positive reaction (i. e., protected mice against the virus of yellow fever), and 8 were negative. The 6 positive samples had been obtained from 4 members of the crew who had been hospitalized in Madeira and from the 2 who had been ill during the voyage but had remained on duty, and the 8 negative samples had been obtained from members of the crew who had not been ill.

DEATHS DURING WEEK ENDED FEB. 27, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 27, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9,954	10,573
Average for 3 prior years	9,302	
Total deaths, first 8 weeks of year	85,533	78,131
Deaths under 1 year of age	646	580
Average for 3 prior years	584	
Deaths under 1 year of age, first 8 weeks of year	5,183	4,571
Data from industrial insurance companies:		
Policies in force	69,272,935	67,956,142
Number of death claims	13,893	16,328
Death claims per 1,000 policies in force, annual rate	10.5	12.6
Death claims per 1,000 policies, first 8 weeks of year, annual rate	11.5	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 6, 1937, and Mar. 7, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936
New England States:								
Maine		1	111	5	26	263	0	0
New Hampshire					9	55	0	0
Vermont	2	1			1	567	0	0
Massachusetts	3	2			916	819	11	8
Rhode Island	1	1			318	39	2	0
Connecticut [1]	1	2	21	26	583	89	1	1
Middle Atlantic States:								
New York	42	37	[2] 56	[2] 109	593	2,368	13	30
New Jersey	13	14	67	89	2,082	148	4	5
Pennsylvania	30	48			388	776	14	14
East North Central States:								
Ohio	24	29	103	39	34	258	9	9
Indiana	11	19	89	82	17	15	1	3
Illinois	44	35	74	63	32	57	7	20
Michigan	12	10	2	6	73	87	1	2
Wisconsin	6	3	120	89	21	76	3	2
West North Central States:								
Minnesota	3	3	3		16	272	2	1
Iowa	3	4	27	8	1	3	0	1
Missouri	20	21	382	618	11	63	3	7
North Dakota	1	1	31	6	1	1	0	2
South Dakota		3	9		3	14	2	0
Nebraska	4	3			1	88	2	0
Kansas	13	12	55	65	5	15	0	0
South Atlantic States:								
Delaware		3	18		73	69	0	1
Maryland [3]	9	8	231	70	693	195	6	15
District of Columbia	4	19	3	4	75	16	0	3
Virginia	16	15		2,046	218	84	8	24
West Virginia	5	14	592	135	38	8	7	11
North Carolina	19	14	217	343	88	58	6	2
South Carolina	6	2	1,707	1,005	33	16	0	1
Georgia [1]	11	13	1,176	1,544			2	13
Florida [1]	5	4	43	61	2	4	3	1
East South Central States:								
Kentucky	21	15	508	73	121	62	20	16
Tennessee	10	24	381	477	20	79	9	29
Alabama	19	13	2,487	2,140	14	63	2	1
Mississippi [3]		5					0	1
West South Central States:								
Arkansas	2	8	308	346	1	1	0	0
Louisiana	14	18	143	141	6	70	2	0
Oklahoma [4]	6	11	809	298	34	5	6	11
Texas [1]	45	62	3,745	1,279	538	648	14	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 6, 1937, and Mar. 7, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936
Mountain States:								
Montana	2	1	29	23	62	18	1	3
Idaho			23	1	28	20	0	0
Wyoming					2	12	0	0
Colorado	8	8			3	8	0	0
New Mexico	5	2	95	9	99	44	1	0
Arizona	7	4	177	213	199	81	1	0
Utah [3]					24	20	0	0
Pacific States:								
Washington	5	1	3	11	23	329	1	2
Oregon		3	121	269	5	564	0	1
California	20	32	1,173	2,099	90	2,729	7	11
Total	472	548	15,134	13,792	7,620	11,276	171	256
First 9 weeks of year	5,056	5,766	224,549	61,971	45,334	66,132	1,418	1,901

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936
New England States:								
Maine	0	0	27	14	0	0	1	0
New Hampshire	0	1	27	13	0	0	0	0
Vermont	0	0	11	20	0	0	1	0
Massachusetts	1	0	224	289	0	0	1	0
Rhode Island	0	0	50	9	0	0	1	0
Connecticut [1]	0	0	97	126	0	0	0	0
Middle Atlantic States:								
New York	1	1	957	1,420	1	0	3	10
New Jersey	1	1	206	617	0	0	2	2
Pennsylvania	1	1	826	611	0	0	3	6
East North Central States:								
Ohio	0	1	313	454	3	1	0	1
Indiana	1	0	246	267	4	3	3	3
Illinois	1	0	707	996	12	22	2	5
Michigan	1	0	628	334	1	1	6	8
Wisconsin	0	1	333	604	9	9	0	2
West North Central States:								
Minnesota	0	1	183	362	8	9	0	0
Iowa	2	0	365	155	18	13	0	3
Missouri	0	1	424	195	89	6	6	0
North Dakota	1	0	50	68	8	1	0	0
South Dakota	0	0	79	40	2	15	0	5
Nebraska	1	0	66	202	5	21	0	0
Kansas	0	2	336	266	31	26	0	1
South Atlantic States:								
Delaware	0	0	10	7	0	0	0	0
Maryland [3]	0	0	31	99	0	0	1	2
District of Columbia	1	0	13	34	0	0	0	0
Virginia	1	1	80	56	0	0	2	2
West Virginia	0	0	45	49	1	0	1	1
North Carolina	0	0	44	43	0	1	6	8
South Carolina	0	0	7	4	0	0	1	0
Georgia [1]	0	0	7	12	1	1	1	1
Florida [1]	2	1	5	2	0	0	1	1
East South Central States:								
Kentucky	0	0	58	72	0	1	11	2
Tennessee	0	1	20	34	0	2	3	1
Alabama	0	1	15	18	0	2	2	1
Mississippi [3]	0	0	7	8	0	0	0	0
West South Central States:								
Arkansas	0	0	17	14	4	0	1	0
Louisiana	0	0	3	17	1	2	6	7
Oklahoma [4]	0	1	40	22	5	0	5	3
Texas [1]	2	0	113	87	1	9	16	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 6, 1937, and Mar. 7, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936	Week ended Mar. 6, 1937	Week ended Mar. 7, 1936
Mountain States:								
Montana	0	0	41	111	22	7	0	0
Idaho	1	0	16	75	3	4	0	0
Wyoming	0	0	41	152	6	12	1	0
Colorado	1	0	73	136	2	13	1	0
New Mexico	0	0	26	88	1	0	4	2
Arizona	0	0	12	20	0	0	0	0
Utah [3]	0	0	13	103	0	1	0	0
Pacific States:								
Washington	0	0	41	100	8	14	2	1
Oregon	0	1	25	59	28	2	0	0
California	3	1	250	387	19	4	6	3
Total	22	17	7,153	8,871	293	202	100	72
First 9 weeks of year	203	158	57,724	68,999	2,657	1,890	985	858

[1] Typhus fever, week ended Mar. 6, 1937, 12 cases, as follows: Connecticut, 1; Georgia, 5; Florida, 2; Texas, 4.
[2] New York City only.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1937										
Alabama	19	102	1,627	129	15	10	2	74	2	16
Florida	25	47	109	13	16	2		36	0	2
Hawaii Territory	1	12	16		1,809		1		0	4
Illinois	36	127	1,530	8	86		6	2,057	70	24
New York	51	166		3	1,268		1	3,024	44	19
North Dakota	6	4	956		139		0	269	145	1
Oklahoma [1]	19	44	2,729	17	32	2	8	139	5	18
Tennessee	22	91	2,698	52	59	11	4	182	0	23
Texas	23	325	6,958	809	1,351	86	8	494	22	64
Virginia	41	146	6,899	2	667	7	2	19	1	26
Washington	4	22	1,542		184		3	255	29	7
February 1937										
Arkansas	23	32	4,636	24	8	23	10	55	14	5
Connecticut	5	11	1,547		1,737		0	392	0	3
Delaware	2	3	28		480		0	30	0	4
Nebraska	1	16	100		35		0	405	12	1
New Mexico	2	11	1,104	4	174		0	124	5	8
North Carolina	13	114	408		336	39	2	172	1	17

[1] Exclusive of Oklahoma City and Tulsa.

January 1937

	Cases
Anthrax:	
New York	1
Chicken pox:	
Alabama	438
Florida	94
Hawaii Territory	116
Illinois	2,074
New York	3,522
North Dakota	163
Oklahoma [1]	125
Tennessee	313
Texas	1,043
Virginia	448
Washington	833
Conjunctivitis:	
Oklahoma [1]	1
Dengue:	
Alabama	1
Texas	18
Dysentery:	
Alabama (amoebic)	1
Hawaii Territory (bacillary)	1
Illinois (amoebic)	5
Illinois (amoebic carriers)	19
Illinois (bacillary)	13
New York (amoebic)	11
New York (bacillary)	55
Oklahoma [1]	2
Tennessee (amoebic)	2
Tennessee (bacillary)	2
Texas (bacillary)	25
Virginia (diarrhea included)	52
Encephalitis, epidemic or lethargic:	
Alabama	1
Illinois	8
New York	15
North Dakota	1
Oklahoma [1]	1
Tennessee	2
Texas	2
Virginia	2
Washington	5
German measles:	
Alabama	2
Illinois	30
New York	103
Tennessee	7
Washington	16
Impetigo contagiosa:	
Tennessee	3
Washington	1
Leprosy:	
Hawaii Territory	6
Mumps:	
Alabama	326
Florida	141
Hawaii Territory	97
Illinois	366
North Dakota	234
Oklahoma [1]	37
Tennessee	238
Texas	909
Virginia	259
Washington	269
Ophthalmia neonatorum:	
Alabama	1
Illinois	2
New York [2]	7
Tennessee	7
Virginia	1

January 1937

	Cases
Paratyphoid fever:	
Florida	1
Illinois	2
New York	3
Tennessee	1
Texas	6
Puerperal septicemia:	
Washington	3
Rabies in animals:	
Alabama	78
Illinois	24
New York [2]	7
Oklahoma [1]	7
Texas	13
Washington	18
Rabies in man:	
Oklahoma [1]	2
Scabies:	
Washington	3
Septic sore throat:	
Hawaii Territory	1
Illinois	9
New York	92
Oklahoma [1]	48
Tennessee	8
Virginia	20
Tetanus:	
Alabama	4
Illinois	1
New York	1
Virginia	1
Trachoma:	
Alabama	1
Illinois	39
Oklahoma [1]	9
Tennessee	5
Virginia	1
Trichinosis:	
Illinois	1
New York	1
Tularaemia:	
Alabama	2
Illinois	32
New York	4
Tennessee	12
Virginia	5
Typhus fever:	
Alabama	18
Florida	3
Hawaii Territory	6
Texas	42
Undulant fever:	
Alabama	3
Illinois	7
New York	20
Oklahoma [1]	11
Tennessee	2
Texas	20
Virginia	1
Washington	2
Vincent's infection:	
Illinois	34
New York [2]	74
North Dakota	5
Oklahoma [1]	1
Tennessee	35
Whooping cough:	
Alabama	118
Florida	37
Hawaii Territory	9
Illinois	752
New York	1,426
North Dakota	4

January 1937

	Cases
Whooping cough—Continued.	
Oklahoma [1]	8
Tennessee	114
Texas	374
Virginia	294
Washington	112

February 1937

	Cases
Chicken pox:	
Arkansas	96
Connecticut	587
Delaware	47
Nebraska	90
New Mexico	73
North Carolina	614
Conjunctivitis:	
Connecticut	18
New Mexico	3
Dysentery:	
Connecticut (bacillary)	2
New Mexico (amoebic)	1
German measles:	
Connecticut	144
Delaware	38
New Mexico	1
North Carolina	109
Lead poisoning:	
Connecticut	1
Mumps:	
Arkansas	48
Connecticut	417
Delaware	21
Nebraska	107
New Mexico	96
Ophthalmia neonatorum:	
Arkansas	3
New Mexico	1
Paratyphoid fever:	
Connecticut	2
Rabies in animals:	
Connecticut	2
New Mexico	1
North Carolina	1
Septic sore throat:	
Connecticut	24
Nebraska	3
North Carolina	4
Tetanus:	
New Mexico	1
Trachoma:	
Arkansas	8
Connecticut	2
New Mexico	1
Trichinosis:	
Connecticut	8
Tularaemia:	
Arkansas	2
North Carolina	8
Typhus fever:	
Connecticut	1
North Carolina	6
Undulant fever:	
Arkansas	4
Connecticut	2
New Mexico	1
North Carolina	4
Whooping cough:	
Arkansas	80
Connecticut	358
Delaware	27
Nebraska	29
New Mexico	28
North Carolina	394

[1] Exclusive of Oklahoma City and Tulsa.

[2] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 27, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	3	0	0	11	3	0	0	0	5	35
New Hampshire:											
Concord	0	------	1	0	4	0	0	0	0	0	12
Manchester	0	3	0	0	0	2	0	0	0	0	4
Nashua	1	------	2	0	3	0	0	------	0	1	------
Vermont:											
Barre	0	------	1	0	0	0	0	2	0	3	4
Burlington	0	------	0	0	0	3	0	0	0	0	13
Rutland	0	------	0	1	1	0	0	0	0	0	10
Massachusetts:											
Boston	0	------	5	9	44	52	0	7	1	100	283
Fall River	0	------	2	9	1	4	0	1	0	15	43
Springfield	0	------	0	25	7	7	0	0	0	6	41
Worcester	0	------	0	162	14	10	0	6	0	37	61
Rhode Island:											
Pawtucket	0	2	0	13	0	2	0	0	0	2	20
Providence	1	------	4	172	10	33	0	2	0	14	78
Connecticut:											
Bridgeport	0	1	0	30	2	21	0	0	0	2	29
Hartford	0	11	0	3	6	7	0	3	0	5	57
New Haven	0	12	0	0	3	2	0	1	1	5	49
New York:											
Buffalo	0	------	2	47	12	27	0	7	0	45	154
New York	28	45	11	131	193	358	0	102	0	57	1,741
Rochester	1	12	1	1	11	6	0	1	0	13	77
Syracuse	0	------	2	26	12	57	0	0	0	49	66
New Jersey:											
Camden	3	1	1	0	4	4	0	2	0	5	34
Newark	0	4	0	469	9	10	0	6	0	20	79
Trenton	0	1	1	0	3	4	0	2	0	2	49
Pennsylvania:											
Philadelphia	1	28	14	17	60	208	0	28	2	116	580
Pittsburgh	2	10	7	8	21	50	0	11	0	36	174
Reading	0	------	3	3	6	14	0	1	0	19	48
Scranton	1	------	------	1	------	12	0	------	0	0	------
Ohio:											
Cincinnati	3	11	1	44	13	24	0	9	0	15	149
Cleveland	4	90	8	2	33	56	0	20	0	61	274
Columbus	0	26	7	0	10	6	0	1	1	10	102
Toledo	2	8	5	21	5	9	0	6	0	48	75
Indiana:											
Anderson	0	------	2	0	2	7	0	0	0	3	13
Fort Wayne	2	------	0	0	0	4	0	0	0	3	28
Indianapolis	0	------	2	0	27	23	0	1	0	9	125
Muncie	0	5	0	0	2	3	1	0	0	0	9
South Bend	0	------	0	0	5	2	0	1	0	2	25
Terre Haute	2	------	0	0	0	3	0	0	0	0	23
Illinois:											
Alton	0	------	0	2	0	6	0	0	0	1	10
Chicago	15	33	10	22	83	232	0	37	0	53	743
Elgin	0	------	1	0	2	1	0	0	0	3	14
Moline	0	------	0	1	1	0	0	0	0	8	7
Springfield	0	1	0	0	5	3	0	0	0	5	28
Michigan:											
Detroit	8	------	6	10	35	451	0	16	0	80	285
Flint	1	------	0	0	0	24	0	1	0	0	28
Grand Rapids	0	------	0	14	6	11	0	0	0	19	40
Wisconsin:											
Kenosha	0	------	0	2	0	5	0	1	0	0	6
Madison	1	------	0	0	0	2	0	0	0	3	21
Milwaukee	0	------	4	5	12	67	0	1	1	31	116
Racine	0	------	0	0	0	5	0	0	0	2	14
Superior	0	------	0	1	0	2	0	0	0	2	7
Minnesota:											
Duluth	0	------	1	0	4	13	0	1	0	9	31
Minneapolis	4	------	0	4	13	32	0	2	0	9	117
St. Paul	0	1	1	2	6	12	0	0	0	48	56

City reports for week ended Feb. 27, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0	------	------	0	------	3	0	------	0	0	------
Davenport	0	------	------	0	------	6	0	------	0	0	------
Des Moines	0	------	------	0	------	31	0	------	0	0	39
Sioux City	0	------	------	0	------	19	2	------	0	2	------
Waterloo	0	------	------	0	------	36	0	------	0	15	1
Missouri:											
Kansas City	1	------	4	1	20	86	1	6	0	15	118
St. Joseph	1	7	1	0	3	13	20	1	0	1	18
St. Louis	7	12	3	1	21	60	4	7	2	63	226
North Dakota:											
Fargo	0	------	0	0	0	11	0	0	0	0	8
Grand Forks	0	------	------	0	------	0	1	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	5
South Dakota:											
Aberdeen	0	------	------	0	------	9	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	7
Nebraska:											
Omaha	2	------	1	0	11	4	0	0	0	8	68
Kansas:											
Lawrence	0	------	0	0	0	1	0	1	0	2	3
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	2	1	0	7	3	6	3	0	2	36
Delaware:											
Wilmington	1	------	0	23	9	1	0	1	0	0	35
Maryland:											
Baltimore	4	29	4	455	39	21	0	18	0	81	288
Cumberland	0	2	0	1	1	0	0	0	0	1	9
Frederick	0	------	0	11	0	0	0	0	0	6	6
Dist. of Col.:											
Washington	10	28	8	75	29	21	0	10	1	10	225
Virginia:											
Lynchburg	2	------	1	6	4	0	0	0	0	9	17
Richmond	0	------	3	0	9	3	0	1	0	0	63
Roanoke	0	------	3	43	7	0	0	0	0	1	27
West Virginia:											
Charleston	0	10	1	2	11	0	0	0	0	0	24
Huntington	0	------	------	0	------	1	0	------	0	0	------
Wheeling	0	------	1	1	5	0	0	0	0	3	26
North Carolina:											
Gastonia	0		0	0	0	0	0	0	0	0	------
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	0	3	0	0	1	0	0	10
Winston-Salem	1	5	0	0	2	0	0	0	0	0	13
South Carolina:											
Charleston	0	118	3	0	2	4	0	0	2	0	22
Columbia	0	------	1	0	2	0	0	1	0	0	24
Florence	0	------	0	0	2	1	0	0	0	0	6
Greenville	1	------	1	0	2	0	0	0	0	2	6
Georgia:											
Atlanta	0	148	14	2	11	8	0	7	0	0	104
Brunswick	0	------	0	1	0	1	0	0	0	5	4
Savannah	1	56	5	0	3	0	0	0	0	1	45
Florida:											
Miami	2	10	1	0	2	3	0	1	0	0	35
Tampa	2	4	3	0	2	0	0	0	1	1	30
Kentucky:											
Ashland	0	------	------	0	------	0	0	------	0	0	------
Covington	0	------	0	0	2	1	0	1	0	0	12
Louisville	1	------	0	1	24	4	0	5	0	28	109
Tennessee:											
Knoxville	0	31	3	4	1	1	0	3	0	0	26
Memphis	1	------	19	1	36	3	0	3	0	16	139
Nashville	1	------	7	0	8	3	0	2	0	0	64
Alabama:											
Birmingham	2	134	6	0	13	3	0	6	0	2	81
Mobile	4	40	9	0	6	1	0	0	0	0	39
Montgomery	0	10	------	0	------	1	0	------	0	3	------
Arkansas:											
Fort Smith	0	------	------	0	------	3	0	------	0	0	------
Little Rock	0	9	0	1	12	4	0	2	0	0	14
Louisiana:											
Lake Charles	0	11	0	0	4	0	0	0	0	0	6
New Orleans	5	30	14	1	43	7	0	11	0	1	182
Shreveport	0	------	0	2	10	0	0	3	0	0	55

City reports for week ended Feb. 27, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Muskogee	0			0		3	0		0	0	
Tulsa	5			2		4	0		0	7	
Texas:											
Dallas	5	15	8	17	17	15	0	7	0	6	83
Fort Worth	0		1	49	3	11	0	3	0	2	50
Galveston	2		0	1	7	3	0	3	0	0	16
Houston	2		2	0	22	1	0	4	1	3	99
San Antonio	0		8	9	10	2	0	8	0	0	89
Montana:											
Billings	0		0	0	0	2	0	0	0	0	3
Great Falls	0		1	0	2	2	0	0	0	3	9
Helena	0	47	0	1	0	9	0	0	0	0	1
Missoula	0	1	1	0	1	1	0	0	0	0	6
Idaho:											
Boise	0		0	0	0	3	0	0	0	0	7
Colorado:											
Colorado Springs	0		0	0	1	1	0	0	0	0	6
Denver	0		1	2	13	14	0	2	0	62	84
Pueblo	0		0	0	3	3	0	0	0	0	8
New Mexico:											
Albuquerque	1	30	2	0	1	3	0	2	0	6	8
Utah:											
Salt Lake City	0		1	13	3	21	0	0	0	19	42
Nevada:											
Reno											
Washington:											
Seattle	1		2	10	7	2	2	5	0	8	97
Spokane	0	3	3	3	6	5	0	1	1	1	42
Tacoma	0		2	0	3	3	0	0	0	0	35
Oregon:											
Portland	0	4	4	3	5	5	3	2	0	3	88
Salem	0	8		0		0	0		0	1	
California:											
Los Angeles	7	57	15	25	45	28	0	26	0	46	404
Sacramento	1	220	1	2	8	10	0	7	0	4	52
San Francisco	1	15	3	2	21	30	0	11	0	12	208

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Virginia:			
Boston	1	0	0	Richmond	1	0	0
Rhode Island:				South Carolina:			
Pawtucket	1	1	0	Charleston	1	0	0
Providence	2	0	0	Florida:			
Connecticut:				Miami	0	0	2
New Haven	1	0	0	Kentucky:			
New York:				Louisville	3	0	0
New York	5	5	0	Tennessee:			
Pennsylvania:				Knoxville	0	1	0
Philadelphia	1	2	0	Memphis	1	0	0
Pittsburgh	1	0	0	Alabama:			
Ohio:				Birmingham	5	1	0
Cincinnati	3	2	0	Louisiana:			
Cleveland	2	1	0	New Orleans	1	1	1
Indiana:				Shreveport	0	1	0
Indianapolis	2	0	1	Oklahoma:			
Illinois:				Tulsa	0	0	1
Chicago	4	2	0	Texas:			
Michigan:				Fort Worth	1	1	0
Detroit	1	0	0	Galveston	1	0	0
Missouri:				Houston	4	0	0
Kansas City	1	0	0	San Antonio	0	1	0
Maryland:				California:			
Baltimore	1	0	0	Los Angeles	3	4	0
Frederick	2	0	0	San Francisco	0	1	0
District of Columbia:							
Washington	1	1	0				

Encephalitis, epidemic or lethargic.—Cases: Louisville, Ky., 2; Portland, Oreg., 1; San Francisco, 1.
Pellagra.—Cases: Baltimore, 1.
Typhus fever.—Cases: New York, 1; Savannah, 1. Deaths: Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended February 13, 1937.—During the 2 weeks ended February 13, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					4					4
Chicken pox		8			817	90	75	29	65	1,084
Diphtheria		7	4		25	2	3		3	44
Dysentery					1					1
Erysipelas		1			11	6		5	19	42
Influenza	6	413	128		4,095	111	789		2,979	8,521
Measles		20	296		736	117	665	211	1,340	3,385
Mumps			701		866	10	47	14	121	1,759
Pneumonia	12				99		13		116	240
Poliomyelitis							1		7	8
Scarlet fever		21	3		274	73	68	104	39	582
Smallpox							1	46		47
Trachoma							8			8
Tuberculosis	1	11	18		75	13	18	10	25	171
Typhoid fever					8		2	1	1	12
Undulant fever					4	1	2		1	8
Whooping cough		78	70		285	9	34	8	12	496

NOTE.—No report received from Quebec.

FINLAND

Communicable diseases—January 1937.—During the month of January 1937, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	515	Poliomyelitis	9
Dysentery	3	Scarlet fever	1,131
Influenza	3,018	Smallpox	1
Lethargic encephalitis	1	Typhoid fever	61
Paratyphoid fever	10		

JAMAICA

Communicable diseases—4 weeks ended February 20, 1937.—During the 4 weeks ended February 20, 1937, cases of certain communicable

diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Lethargic encephalitis		1
Chicken pox	2	6	Puerperal fever	1	
Diphtheria	2	1	Scarlet fever	1	1
Dysentery	7	4	Tuberculosis	28	78
Erysipelas		1	Typhoid fever	6	43
Leprosy	1	3			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for February 26, 1937, pages 255-267. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued March 26, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Siam.—According to information dated February 3, 1937, received from the American Consulate General at Bangkok, Siam, the cholera epidemic in Siam is increasing. For the last 2 weeks of January, 476 cases with 284 deaths were officially reported, making a total of 1,078 cases and 661 deaths since the beginning of the outbreak. For the same 2 weeks, 137 new cases with 74 deaths were reported in Bangkok and vicinity, bringing the total number of cases there to 173 and that of deaths to 93 for the month of January. The epidemic has spread to 57 districts, as compared with 39 for the preceding 2-week period. It was stated that practically all of the foreign population in Bangkok had been inoculated and that compulsory inoculation on a large scale had been undertaken in some sections among the natives.

Plague

Egypt—Girga Province.—On February 28, 1937, one fatal case of plague was reported in Girga Province, Egypt.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—Two rats found on March 9, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been proved plague infected.

Smallpox

Nicaragua—Puerto Cabezas.—During the week ended February 27, 1937, two cases of smallpox were reported in Puerto Cabezas, Nicaragua.

Palestine—Jaffa.—During the period January 15–31, 1937, two cases of smallpox were reported in Jaffa, Palestine.

Typhus fever

Hungary—Department of Borsod.—During the week ended February 20, 1937, seven cases of typhus fever were reported in the Department of Borsod, Hungary.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 52 :: :: NUMBER 13

MARCH 26 - - - 1937

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PREVALENCE OF DISEASE

PUBLIC HEALTH REPORTS

VOL. 52 MARCH 26, 1937 NO. 13

PULMONARY TUMORS IN MICE

III. *The Serial Transmission of Induced Lung Tumors*[1]

By H. B. Andervont, *Biologist, United States Public Health Service*

The object of this paper is to record the serial passage of seven lung tumors which appeared in mice following parenteral introduction of 1, 2, 5, 6–dibenzanthracene. Many investigators have found spontaneous (*3*) or induced (*4*) lung growths in mice, but only a few have reported efforts to implant the growths into other mice. Tyzzer (*14*, *15*) inoculated five mice subcutaneously from a spontaneous lung tumor of his series without success.[2] Murray (*11*) reported the successful transplantation of two lung metastases. Haaland (*9*) transplanted a spontaneous pulmonary growth into 40 mice with negative results. Gierki (*7*) transplanted three lung metastases, one of which grew in the inoculated mice. Mercier (*10*) found massive lymphadenomata in the lungs of a strain of mice which grew, when implanted, into other mice of the same strain.

In most of the above-mentioned efforts to transplant lung growths, no mention was made of any particular strain of mice, and so it is assumed that pure strain animals were not used. Geneticists have shown that the genetic constitution of the inoculated animal is of utmost importance in obtaining successful growth of transplanted tumor tissue. The reader is referred to a publication by Bittner (*5*) in which this subject has been discussed.

In this laboratory (*1*) pulmonary tumors have appeared in strain A mice following subcutaneous injection of lard solutions of 1, 2, 5, 6–dibenzanthracene. In the work to be presented, lung tumors arising in strain A mice have been implanted into the subcutaneous tissues of other members of the same strain. A few of the more recent passages have been accomplished by the inoculation of backcross mice obtained by breeding hybrids of strain A and C_{57} blacks back to the parent strain A stock. These backcross animals have grown the tumors as well as the strain A mice.

The customary trocar technique was used for all implantations, which were made into the subcutaneous tissues of the right axillary

[1] From the Office of Cancer Investigations, U. S. Public Health Service, Harvard Medical School, Boston,

[2] In one of these papers Tyzzer (*14*) records finding intranuclear cell inclusions in the organs of normal mice. This should be of interest to workers in the filterable virus field.

region. The results of inoculation are presented in the following descriptions of the serial transmission of the various tumors.

SERIAL TRANSMISSION

Lung tumor A.—A strain A mouse received subcutaneous injections of a lard–dibenzanthracene solution on April 18 and 26, 1935, and a subcutaneous tumor was noted 140 days after the first injection. The mouse was autopsied on September 19, 1935, and four small nodules, each about 1 mm in diameter, were dissected from its lungs and all were implanted into one mouse. There was no evidence of growth for 46 days, and then a small nodule was palpable at the site of implantation. The nodule grew slowly and was 8 mm in diameter 82 days after inoculation, when it was removed and pieces of it were used to inoculate four other mice. All of these had palpable tumors 13 days later. The largest, measuring 10 by 5 by 4 mm, was used for passage 18 days after inoculation and grew in all the mice. The tumor had undergone 23 serial passages up to December 1, 1936. It has been consistent in its ability to grow rapidly and progressively and destroys the host in 4 to 6 weeks.

Lung tumor B.—A strain A mouse received subcutaneous injections of lard–dibenzanthracene on April 18 and 26, 1935. It was killed and autopsied 187 days later. No tumor was found at the site of injection, but there were numerous nodules in the lungs. One of these, measuring 2 mm in diameter, was dissected out and used to inoculate one mouse in which there was no evidence of growth for 22 days, and then a small nodule was noted at the inoculation site. The nodule grew slowly, and 64 days after implantation it was removed and found to measure 10 by 5 by 5 mm. Pieces were used for passage to four other mice, all of which exhibited definite masses 20 days later. The largest, measuring 14 by 10 by 10 mm, was used for passage to four mice, all of which had definite tumors 16 days later. The tumor had undergone 16 serial passages up to December 1, 1936. It grows progressively in all strain A mice, which die within 6 to 8 weeks.

Lung tumor C.—The strain A mouse in which this tumor arose received subcutaneous injections of lard–dibenzanthracene solution at the same time as did the mice from which lung tumors A and B were obtained. The mouse developed a tumor at the site of injection and was autopsied 167 days after the initial injection. Among other nodules, its lungs contained one about 3 mm in diameter, which was removed and a piece from it was inoculated into one mouse. The first definite indication of a successful implantation was observed 60 days later, when a small, hard nodule was felt in the subcutaneous tissues of the inoculated mouse. It grew slowly, and when the mouse was killed 98 days after receiving the transplant the tumor measured

7 mm in diameter. It consisted of a hard mass surrounded by an area of hemorrhage. The hard portion of the mass was passed to two other mice, which had small growths 28 days later. The tumor grew progressively in one mouse for 63 days before the animal died. The other tumor, measuring 12 by 10 by 6 mm, was used for passage to four other mice 35 days after implantation, and it grew in all of them. The growth had passed through 13 animal transfers up to December 1, 1936. It grows progressively in all strain A mice but somewhat slower than tumors A or B.

Lung tumor D.—The original tumor-bearing mouse also received the lard–dibenzanthracene injections on April 18 and 26, 1935. It was killed 187 days after the first injection; and, although it was tumor-free at the site of injection, its lungs contained several macroscopic nodules. An isolated nodule about 3 mm in diameter was removed from the lung tissue and a piece was implanted into one mouse. No record was made when the tumor was first noted, but 25 days after inoculation a hard mass 4 mm in diameter was removed from the mouse and used to inoculate three normal mice. It was 38 days after inoculation before definite nodules appeared at the site of inoculation. The history of all three of these second passage animals is presented, because each was used for passage. One of these mice was killed 50 days after inoculation, and a hard mass 7 by 5 mm was removed from its right axilla and used to inoculate three normal animals. One of these failed to grow the tumor; another developed a small nodule 28 days after inoculation, which persisted for 12 more days and then disappeared; the third mouse also developed a nodule 28 days following inoculation, which grew slowly for 1 week and then remained stationary. The mouse died 90 days after inoculation.

The next second-passage mouse was killed 85 days after inoculation. A mass 10 mm in diameter was removed, which consisted of soft tissue surrounded by a hard capsule. Portions of the soft substance were inoculated into four normal mice and grew progressively in all of them. Subsequent serial passages have been carried on from these mice.

The third and last mouse of the second passage was killed 118 days after inoculation. Its mass was 10 by 8 by 8 mm, and it also consisted of soft tissue surrounded by a hard fibrous capsule. The soft material was inoculated into three mice and the hard outer capsule into two mice. Growth occurred in all three which had received the soft material and in one of the two which had received the hard material. These results indicated that both the inner soft encapsulated material and the outer hard layer contained tumor cells.

The four mice of the third passage developed nodules 30 days after inoculation. One tumor was used for passage 85 days after inoculation, when it measured 12 by 8 by 8 mm. The other three

mice had slow-growing tumors and died 110, 117, and 136 days, respectively, after they had been inoculated.

The tumor had undergone 12 serial passages up to December 1, 1936. It grows at the same rate as tumors A and B, requiring about 2 months to cause death.

Lung tumor F.—This tumor arose in the lungs of an experimental strain A animal used by Dr. M. J. Shear (*12*). The mouse had received a cholesterol pellet subcutaneously containing 0.001 percent of 1,2,5,6-dibenzanthracene on August 14, 1934. It was subjected to autopsy on February 8, 1936. No tumor had developed around the pellet, but a large nodule 4 mm in diameter was found in the lungs. A mouse received an implantation of a piece of the nodule and 45 days later a small nodule appeared at the site of inoculation. The nodule grew slowly, and when the mouse was sacrificed 91 days after inoculation, the nodule measured 10 by 8 mm. Pieces were used to inoculate four mice, in which growths were felt 13 days later. The tumor had undergone seven passages up to December 1, 1936.

Lung tumor G.—The original growth was found in a strain A mouse which had received an intraperitoneal injection of a lard-dibenzanthracene solution on September 25, 1935. It was killed 6 months later and autopsy revealed a large pulmonary growth measuring 8 mm in diameter, growing on the surface of the upper right lobe of the lungs. Pieces were used for the inoculation of two mice. Small masses were felt in these mice 49 days later, and they continued to grow up to the time the mice were killed. One animal was killed 119 days after its inoculation and pieces of the growth, which measured 15 by 10 by 8 mm, were used for passage to four normal mice. Tumors were noted in two of these mice 19 days later; one was killed 57 days after inoculation, when its tumor was 12 mm in diameter. Pieces of this tumor were implanted into five mice, which developed nodules 53 days later. A tumor from one of these, measuring 10 by 8 by 6 mm, was used for passage 88 days after its implantation. The tumor had grown through these three serial passages up to December 1, 1936.

Lung tumor H.—The tumor was found in the lungs of a strain A mouse which had received a subcutaneous injection of 1, 2, 5, 6-dibenzanthracene-choleic acid on May 29, 1935, in the course of an experiment performed by Dr. M. J. Shear (*13*). No tumor appeared at the site of injection, but when the animal came to autopsy on February 8, 1936, its lungs were full of tumor nodules. One was dissected out and a piece transplanted into a mouse. A palpable nodule was noted 75 days later, which grew very slowly. The mouse was killed 212 days after inoculation and the mass, measuring 12 by 11 by 6 mm, was removed and cut into pieces for transplantation. It was found to consist of soft tissue surrounded by a hard capsule,

similar to the growth found in the second passage of tumor D. The soft material was implanted into five mice and grew in all. Further inoculations have been made from the tumors of these animals. Thus, the tumor had grown through two passages up to December 1, 1936.

Comment.—All the tumors arose in strain A mice and have been propagated in either these mice or strain A backcross mice. Because of the growth energy displayed by tumors A and C, it was thought that they might grow in other strains, but thus far all such efforts have been unsuccessful. All the tumors which have undergone 10 or more serial passages grew slowly in mice of the earlier passages and increased in growth energy in later passages. For the sake of brevity, a summary of the time elapsing between inoculation and the appearance of a palpable nodule in the earlier passages of all tumors is presented in table 1.

TABLE 1.—*Showing the latent period between implantation and the appearance of nodules at the site of inoculation*

Passage number	1	2	3	4	5	6	7
Lung tumor	Number of days between the time of inoculation and when a nodule was felt at the site of inoculation						
A	46	13	7	7	7	7	7
B	22	20	16	7	7	7	7
C	60	28	7	7	7	7	7
D	------	38	30	13	7	7	7
F	45	13	14	14	14	14	14
G	49	19	53	------	------	------	------
H	75	30	------	------	------	------	------

Table 1 shows that, with the exception of tumor F, all the tumors grew more slowly during the first two passages. While the small size of the piece implanted may have accounted for this fact in the first passage of tumors A and B, it was not responsible for the same results with the others, for the original tumors C, D, F, G, and H were of sufficient size to furnish pieces as large as those usually employed for such inoculations. Furthermore, the amount of tumor tissue used in the second passage of all the growths was as large as that employed in subsequent implantations, and, as seen in table 1, these pieces also grew more slowly than most of the succeeding implants. It is possible that two or three passages were necessary before the lung growths became sufficiently adapted to the subcutaneous tissues to grow with regularity. After this period of adjustment, lung tumors A, B, C, D, and F have assumed, in subsequent passages, a growth rhythm similar to other transplantable mouse tumors. None of the passage tumors possesses a tendency to metastasize to the lungs.

In a previous publication (*2*) it was shown that tumors growing within the skin of mice served as excellent test objects for the presence

of the hemorrhage-producing factor in *B. coli* filtrates. Lung tumors A, B, C, D, and F of the 21, 14, 11, 10, and 6 passages, respectively, were inoculated into the skin of strain A backcross mice. An intraperitoneal injection of *B. coli* filtrate produced hemorrhage in tumors A, B, C, and D, but not in tumor F.

HISTOLOGICAL STUDIES

Pieces of the original growths of tumors A and B were not available for histological examination, but pieces of the original lung nodules of the other five tumors were fixed and stained. When a passage tumor had been selected for transfer, a piece was removed and cut into two parts; one of these parts was used for inoculation and the other was dropped into a fixative. Thus, material for histological studies was obtained from an area of tumor adjacent to the pieces used for transplantation. In this manner a complete series of sections representing the first 10 passages of each tumor were or will be obtained. When the original pulmonary growth arose in a mouse which had a subcutaneous tumor, pieces of the latter were also fixed. Sections were also prepared from a number of other tumors in the series which were not used in the direct serial passages.

Histological studies of the tumor passages have proved to be of considerable interest and are still in progress. It is apparent that some of the tumors have experienced a change in their histological structure while undergoing animal passage. The following brief description of the findings in tumors A, B, C, D, and F will serve to illustrate this point.

Lung tumor A.—Sections of the original tumor are not available, since four primary nodules were used in the first passage. All sections made from the first to the tenth passage reveal that this growth is apparently a sarcoma. While it would appear that one of the transplanted nodules may have been a metastasis to the lungs, histological studies of the subcutaneous tumor and the transplanted lung growth, as well as the influence of transplantation upon the other tumors to be described next, tend to throw some doubt upon this possibility. Further studies are necessary before any definite conclusion can be reached.

Lung tumor B.—Sections of the first passage of this tumor consist almost exclusively of adenocarcinoma cells. The second passage tumor, however, is a mixed tumor, for both sarcomatous and carcinomatous tissues are seen, while sections of the third passage tumor consist mostly of sarcoma cells. All subsequent passages of the tumor consist of sarcomatous tissue only.

Lung tumor C.—The original lung nodule and the first passage growth are adenocarcinomas; but in view of the change which is

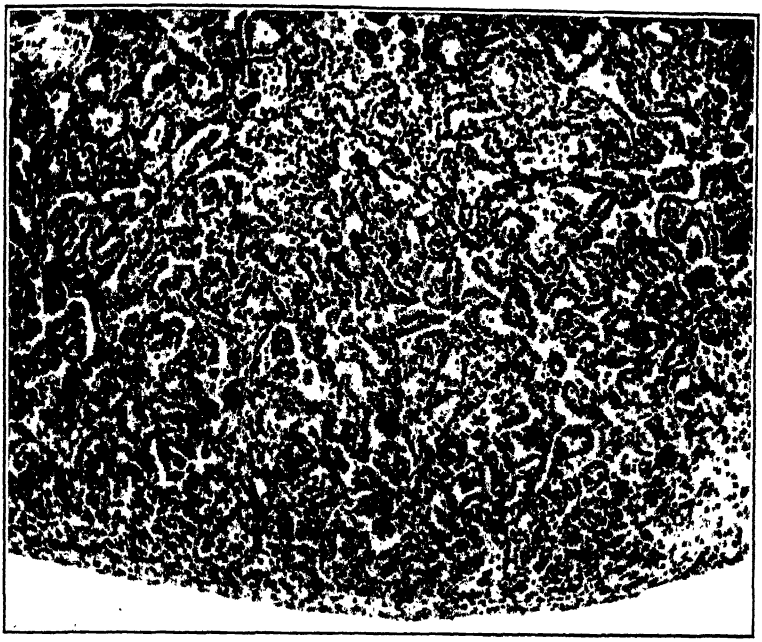

FIGURE 1.—Lung tumor D. Primary growth. × 100.

FIGURE 2.—Lung tumor D. First passage, showing portion of fibrous capsule and malignant epithelial cells within and penetrating capsule. × 100.

FIGURE 3.—Lung tumor D. Second passage, showing adenocarcinoma cells. × 100.

FIGURE 4.—Lung tumor D. Third passage, showing fibrous capsule and malignant epithelial and spindle cells. × 100.

known to have occurred in the tumor, some of the connective tissue cells may be regarded as exhibiting malignant characteristics. The second passage tumor is made up of carcinomatous elements for the most part, but there is also a considerable amount of fibrous tissue present, some of which appears to be sarcomatous. The third passage tumor retains the structure of a transplantable adenocarcinoma, but many of the stroma cells are definitely sarcomatous in appearance. The fourth passage consists almost entirely of sarcoma cells, and the tumor retains its sarcomatous structure in all succeeding passages.

Lung tumor D.—It will be recalled that this tumor arose in an animal which did not have a subcutaneous tumor at the site of injection. The original lung nodule and the first and second passage tumors are adenocarcinomas containing small groups of cells which may be sarcomatous. The third passage tumor is a mixed growth in which areas of carcinomatous tissue are seen among sarcoma cells. From the fourth passage the tumor continues to grow as a sarcoma. Photomicrographs of the original lung nodule and the first three passages are presented in order to illustrate the changes occurring in the various passages.

Lung tumor F.—The primary lung tumor is an adenocarcinoma and the transplanted tumors consist of carcinomatous elements in eight subsequent passages.

COMMENT CONCERNING HISTOLOGICAL STUDIES

The prevailing malignant cell in the primary growths of tumors B, C, and D were of epithelial origin, and during the earlier passages of these tumors the carcinomatous elements remained predominant. In succeeding animal passages, however, sarcomatous elements became predominant in all three tumors. This phenomenon has been known to occur in other transplantable tumors. Haaland (*8*), in 1908, published an exhaustive study of the changes he observed in transplantable mouse tumors. One of these arose as a carcinoma and histological studies of the primary growth convinced him "that there can be no question of a primary mixed tumor in the usual sense of the word." After a series of animal passages the tumor changed to a pure sarcoma; and, after careful examination of all histological evidence, Haaland arrived at the conclusion that "all evidence seems to speak for a gradual process by which apparently normal connective tissue cells evolve into sarcomatous elements." Studies of another transplantable carcinoma which exhibited the same phenomenon led Haaland to conclude that "the primary growth already shows stroma cells with sarcomatous properties."

Whether the primary lung nodules in the present studies arose as mixed tumors or whether the supporting connective tissue cells be-

came sarcomatous while in passage animals, or whether the malignant epithelial cells changed in appearance is as yet unknown. Histological studies suggest, however, that among the predominant carcinomatous tissue of the primary growths were also some sarcoma cells. It is known that 1, 2, 5, 6–dibenzanthracene evokes malignant changes in a variety of tissues. In view of this knowledge, it is possible that the carcinogenic compound, or a derivative, came into contact with lung tissue, where it produced malignant changes in both the epithelial tissues and the stroma cells. If the subcutaneous tissues of the passage mice were better soil for growth of the sarcomatous elements of the transplanted tumors, it seems that they should overgrow the carcinomatous tissue of the primary growth. However, it is not clear why carcinoma cells were predominant in the earlier passages, and, thus far, it is not known whether sarcoma cells are able to overgrow the carcinoma cells in the first or second passages of induced lung growths if the tumor-bearing mice are kept until they succumb to tumor growth. Experiments designed to answer this question are now in progress.

It is believed that animal passage of other induced lung tumors will also reveal the change of carcinomatous to sarcomatous structure. Hence, the induced growths offer an opportunity for histological investigation of the phenomenon without waiting for its fortuitous occurrence.

Lung tumor F, which arose as an adenocarcinoma, maintained its carcinomatous appearance through eight animal passages. It should be mentioned that tumors A, B, C, and D arose in strain A mice which were less than 9 months old and were, in all probability, induced by injections of the carcinogenic agent. Lung tumor F, however, was found in a strain A mouse which was at least 20 months old, and Bittner (*6*) has reported that the majority of strain A mice develop spontaneous pulmonary tumors before they attain this age. It is possible that tumor F arose as a spontaneous tumor, and it should be of interest to observe whether it also changes into a pure sarcoma.

Transplantations of spontaneous pulmonary tumors are in progress to ascertain whether they will exhibit the same phenomenon.

SUMMARY

Seven pulmonary tumors arising in strain A mice which had received 1, 2, 5, 6–dibenzanthracene parenterally have undergone from 3 to 23 serial passages in the subcutaneous tissues of normal mice. Three of the tumors consisted of carcinomatous elements mostly in the primary tumor as well as in the earlier passages, and all three have changed into sarcomas in subsequent passages. One other tumor has retained its carcinomatous structure through eight animal passages.

It is suggested that the three tumors exhibiting a change in their histological appearance arose as mixed tumors induced by the direct action of a carcinogenic agent upon both epithelial and connective tissue elements in the lungs.

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MEASUREMENTS OF ULTRAVIOLET RADIATION AND ILLUMINATION IN AMERICAN CITIES, 1931 TO 1933

During the years 1931 to 1933 a survey of atmospheric pollution was made by the United States Public Health Service in Baltimore, Boston, Buffalo, Chicago, Cleveland, Detroit, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, and Washington. In this survey the atmospheric pollution due to smoke was recorded, samples of the dust in the air were collected and analyzed, and various meteorological factors, such as relative humidity and wind velocity, were measured and recorded. The methods of the study and the principal results have been reported in Public Health Bulletin No. 224.

During the survey, measurements were made in each city of the ultraviolet radiation and of the illumination at 9 a. m., noon, and 3 p. m. These measurements were not given in the original report of the study, as it was found difficult to correlate them with the atmospheric pollution. The measurements, however, represent a wide geographical distribution of these factors, covering a large part of the United States, and are of interest in themselves. They have therefore been published in a separate report, Public Health Bulletin No. 233. The measurements recoded in this Bulletin have been divided into those for clear and cloudy skies, and for cities north of latitude 37° and those south of latitude 35°. Monthly averages were determined

for these four groups for the ultraviolet radiation and for the illumination. Average ratios of the ultraviolet radiation to the illumination have also been calculated.

For the northern cities the average intensity, on a horizontal surface under a clear sky at noon, of the antirachitic ultraviolet, that is, of the ultraviolet less than 313 millicrons in wave length, was found to vary from 8.4 microwatts per square centimeter in January to 85.1 microwatts per square centimeter in May. At 9 a. m. it varied from 0.4 in January to 39.1 in May. The corresponding averages at 3 p. m. were 1.7 and 41.4. The average intensity of the illumination at noon in January was 3,060 foot-candles; in May, 8,540 foot-candles. The corresponding values at 9 a. m. were 1,200 and 6,080 foot-candles, and at 3 p. m., 1,820 and 5,700 foot-candles. The average intensity, both of the ultraviolet radiation and the illumination, was, in general, for the same time of the year, higher for the southern cities than for the northern. Under clear skies, this difference was much greater in the winter than in the summer.

For the northern cities, the highest value of the illumination was 10,200 foot-candles at noon in Cleveland on July 9, 1932. The corresponding value of the antirachitic ultraviolet radiation was 85.0 microwatts per square centimeter. The highest value of the antirachitic ultraviolet was 86.5 microwatts per square centimeter in Washington on May 20, 1932. The corresponding value of the illumination was 9,000 foot-candles. The average antirachitic ultraviolet radiation per foot-candle was found to be 9.44 thousandths of a microwatt in June and 2.71 thousandths of a microwatt in January.

The two outstanding features of the study appear to be, first its general nature, the measurements having been made in 14 of the principal cities of the country for different seasons of the year, and, second, the determination of the ratio of the antirachitic ultraviolet radiation to the illumination. The latter is probably the most interesting and novel contribution of the present study, since, if the value of the illumination is known, the approximate amount of antirachitic ultraviolet radiation can be determined from the value of this ratio given in table 5 and plotted in figure 7 of the Bulletin.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period July–December 1936

There is printed herewith a list of publications of the United States Public Health Service issued during the period July–December 1936.

The most important articles that appear each week in the PUBLIC HEALTH REPORTS are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of

especial value and interest to public health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and as long as the supply lasts may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D. C. Those publications marked with an asterisk are not available for free distribution but, unless stated to be "out of print", may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., *at the prices noted.* (No remittances should be sent to the Public Health Service.)

Periodicals

*Public Health Reports (weekly), July-December, vol. 51, nos. 27–52, pages 871 to 1,815. 5 cents a copy.

*Venereal Disease Information (monthly), July-December, vol. 17, nos. 7 to 12, pages 177 to 378. 5 cents a copy.

Reprints From the Public Health Reports

1758. History and frequency of typhoid fever immunizations and cases in 9,000 families. Based on Nation-wide periodic canvasses, 1928–31. By Selwyn D. Collins. July 10, 1936. 30 pages.

1759. Post-mortem findings in fatalities due to the use of the arsphenamine group. A review of 44 autopsies. By S. S. Cook. July 10, 1936. 9 pages.

1760. Important causes of sickness and death. By Rollo H. Britten. July 17, 1936. 23 pages.

1761. Communicable diseases and activities for their control in the Brunswick-Greensville area. Brunswick-Greensville health administration studies no. 7. By. J. O. Dean and Elliott H. Pennell. July 24, 1936. 23 pages.

1762. Report on market-milk supplies of urban communities. Compliance of the market-milk supplies of urban communities with the Grade A pasteurized and Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code (as shown by ratings of 90 percent or more reported by the State milk-sanitation authorities during the period July 1, 1934, to June 30, 1936). August 14, 1936. 5 pages.

1763. Mortality from automobile accidents among children in different geographic regions of the United States, 1930. Studies on the fatal accidents of childhood no. 1. By William M. Gafafer. August 7, 1936. 8 pages.

1764. Extent of rural health service in the United States, December 31, 1931, to December 31, 1935. August 14, 1936. 17 pages.

1765. An estimate of the monetary value to industry of plant medical and safety services. By Dean K. Brundage. August 21, 1936. 15 pages.

1766. Directory of whole-time county health officers, 1936. August 21, 1936. 11 pages.

1767. Time changes in the relative mortality from automobile accidents among children in different geographic regions of the United States, 1925 to 1932. Studies on the fatal accidents of childhood no. 2. By William M. Gafafer. August 28, 1936. 9 pages.

1768. Tabulation of health department services. Report of committee on records and reports to State and Territorial health officers and the United States Public Health Service in thirty-fourth annual conference, Washington, D. C. April 13–14, 1936. September 4, 1936. 16 pages.
1769. Acute response of guinea pigs to vapors of some new commercial organic compounds. XII. Normal butyl acetate. By R. R. Sayers, H. H. Schrenk, and F. A. Patty. September 4, 1936. 8 pages.
1770. The official United States and international unit for standardizing gas gangrene antitoxin (histolyticus). By Ida A. Bengtson and Sarah E. Stewart. September 11, 1936. 10 pages.
1771. Public Health Service publications. A list of publications issued during the period January–June 1936. September 11, 1936. 4 pages.
1772. Time changes in the relative mortality from accidental burns among children in different geographic regions of the United States, 1925–32. Studies on the fatal accidents of childhood no. 3. By William M. Gafafer. September 18, 1936. 9 pages.
1773. Acute response of guinea pigs to vapors of some new commercial organic compounds. XIII. Methyl formate. By H. H. Schrenk, W. P. Yant, John Chornyak, and F. A. Patty. September 25, 1936. 9 pages.
1774. Studies of sewage purification. V. Oxidation of sewage by activated sludge. By P. D. McNamee. July 31, 1936. 11 pages.
1775. Resistance of various strains of E. typhi and Coli aerogenes to chlorine and chloramine. By Lucy S. Heathman, G. O. Pierce, and Paul Kabler. October 2, 1936. 21 pages.
1776. Audiometric studies on school children. I. The consistency and significance of tests made with a 4–A audiometer. By Antonio Ciocco. October 9, 1936. 15 pages.
1777. Lysine and malignant growth. I. The amino acid lysine as a factor controlling the growth rate of a typical neoplasm. By Carl Voegtlin and J. W. Thompson. October 16, 1936. 8 pages.
1778. Lysine and malignant growth. II. The effect on malignant growth of a gliadin diet. By Carl Voegtlin and Mary E. Maver. October 16, 1936. 9 pages.
1779. State and insular health authorities, 1936. Directory, with data as to appropriations and publications. October 23, 1936. 19 pages.
1780. The selenium problem in relation to public health. A preliminary survey to determine the possibility of selenium intoxication in the rural population living on seleniferous soil. By Maurice I. Smith, K. W. Franke, and B. B. Westfall. October 30, 1936. 10 pages; 1 plate.
1781. Plague eradicative measures on the Island of Maui, Territory of Hawaii. By A. L. Dopmeyer. November 6, 1936. 24 pages; 4 plates.
1782. The efficiency of rapid sand filters in removing the cysts of the amoebic dysentery organisms from water. By John R. Baylis, Oscar Gullans, and Bertha Kaplan Spector. November 13, 1936. 9 pages; 1 plate.
1783. City health officers, 1936. Directory of those in cities of 10,000 or more population. November 13, 1936. 18 pages.
1784. Audiometric studies on school children. II. Types of audiometric curves. By Antonio Ciocco. November 20, 1936. 13 pages.
1785. The evaluation of health services. By Joseph W. Mountin. November 27, 1936. 8 pages.
1786. Time changes in the mortality from accidental mechanical suffocation among infants under 1 year old in different geographic regions of the United States, 1925–32. Studies on the fatal accidents of childhood no. 4. By William M. Gafafer. November 27, 1936. 6 pages.

1787. The physiological response of peritoneal tissue to certain industrial and pure mineral dusts. By John W. Miller and R. R. Sayers. December 4, 1936. 13 pages; 10 plates.

1788. Duration and cost of Federal compensation cases with disease as a complicating factor. By William M. Gafafer. December 11, 1936. 12 pages.

1789. History and frequency of diphtheria immunizations and cases in 9,000 families. Based on Nation-wide periodic canvasses, 1928–31. By Selwyn D. Collins. December 18, 1936. 38 pages.

1790. An organization for promoting mental hospital services in the United States and Canada. By Walter L. Treadway. December 25, 1936. 9 pages.

Supplements to the Public Health Reports

118. Experiments on the tolerance and addiction potentialities of dihydrodesoxymorphine–D ("desomorphine"). By Nathan B. Eddy and C. K. Himmelsbach. 1936. 33 pages.

119. The notifiable diseases. Prevalence in States, 1935. 1936. 12 pages.

120. International Sanitary Convention for Aerial Navigation. 1936. 24 pages.

121. The relief of pain in cancer patients. By Ernest M. Deland. 1936. 5 pages.

Public Health Bulletins

228. Epidemiological studies of poliomyelitis in Kentucky. By L. L. Lumsden. August 1936. 56 pages.

229. Skin hazards in American industry. Part II. By Louis Schwartz. September 1936. 80 pages; 38 plates.

230. Experience of the health department in 811 counties, 1908–34. By Joseph W. Mountin, Elliott H. Pennell, and E. Evelyn Flook. October 1936. 40 pages.

231. Studies of heart disease mortality. An analysis of the accuracy of deaths recorded as being due to heart disease in Washington, D. C., during 1932, with a discussion of the defects of the present method of tabulating deaths, and suggestions for a new system based upon etiological factors. By O. F. Hedley. October 1936. 49 pages.

*232. Review of plague in Seattle (1907) and subsequent rat and flea surveys. By L. D. Fricks. November 1936. 28 pages. 10 cents.

National Institute of Health Bulletin

168. The experimental pathology and pathologic histology produced by the toxin of Vibrion septique in animals. By Joseph G. Pasternack and Ida A. Bengtson. August 1936. 46 pages; 13 plates.

Unnumbered Publication

Index to Public Health Reports, vol. 51, part 1 (January–June 1936). 1936. 24 pages.

Reprints From Venereal Disease Information

*54. Recommendations for a venereal disease control program in State and local health departments. By R. A. Vonderlehr, Herman N. Bundesen, Joseph Earle Moore, N. A. Nelson, P. S. Pelouze, William F. Snow, John H. Stokes, U. J. Wile, and Lida J. Usilton. Vol. 17, no. 1. 16 pages. 5 cents.

55. Cardiovascular syphilis. Cooperative clinical studies in the treatment of syphilis. By Harold N. Cole, Lida J. Usilton, Joseph Earle Moore, Paul A. O'Leary, John H. Stokes, Udo J. Wile, Thomas Parran, and R. A. Vonderlehr. Vol. 17, no. 4. 28 pages.

*56. Venereal disease control programs of the State departments of health. Vol. 17, no. 7. 33 pages. 5 cents.
57. Syphilis in a large industrial organization. By G. H. Gehrman. Vol. 17, no. 8. 3 pages.
58. The occurrence in leprosy of positive serodiagnostic tests for syphilis. By H. H. Hazen, Thomas Parran, Arthur H. Sanford, F. E. Senear, Walter M. Simpson, and R. A. Vonderlehr. Vol. 17, no. 9. 7 pages.
59. Untreated syphilis in the male Negro. By R. A. Vonderlehr, Taliaferro Clark, O. C. Wenger, and J. R. Heller. Vol. 17, no. 9. 6 pages.
*60. The control of syphilis. A critical examination of some of its problems. By John H. Stokes. Vol. 17, no. 11. 27 pages. 5 cents.

Supplements to Venereal Disease Information

*2. The control of syphilis. A symposium. 70 pages. 10 cents.
*3. Proceedings of Conference on Venereal Disease Control Work, Washington, D. C., December 28–30, 1936. 154 pages. 15 cents.

DEATHS DURING WEEK ENDED MARCH 6, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 6, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	9,612	10,136
Average for 3 prior years	9,738	
Total deaths, first 9 weeks of year	95,142	88,265
Deaths under 1 year of age	620	600
Average for 3 prior years	646	
Deaths under 1 year of age, first 9 weeks of year	5,803	5,175
Data from industrial insurance companies:		
Policies in force	69,355,137	68,069,308
Number of death claims	16,894	14,637
Death claims per 1,000 policies in force, annual rate	12.7	11.2
Death claims per 1,000 policies, first 9 weeks of year, annual rate	11.6	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 13, 1937, and Mar. 14, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936
New England States:								
Maine	-------	3	116	8	15	238	0	1
New Hampshire	-------	1	-------	-------	11	34	0	0
Vermont	-------	-------	-------	-------	1	502	0	0
Massachusetts	-------	3	-------	-------	810	986	5	8
Rhode Island	1	-------	-------	4	253	82	1	1
Connecticut	2	2	42	25	625	88	0	2
Middle Atlantic States:								
New York	44	38	[1] 47	[1] 66	577	2,444	11	28
New Jersey	10	16	39	97	2,015	226	1	9
Pennsylvania	47	40	-------	-------	299	865	6	17
East North Central States:								
Ohio	17	26	147	130	137	389	14	13
Indiana	15	19	91	36	10	14	4	2
Illinois	30	35	75	81	49	52	5	19
Michigan	14	4	3	5	64	80	2	0
Wisconsin	3	2	91	67	23	109	2	1
West North Central States:								
Minnesota	16	4	2	-------	38	384	1	3
Iowa	4	14	4	7	4	4	1	5
Missouri	18	10	195	837	13	13	3	10
North Dakota	4	-------	4	4	3	1	0	0
South Dakota	2	4	-------	-------	4	5	0	0
Nebraska	3	9	23	12	8	25	1	2
Kansas	13	13	43	172	10	-------	2	3
South Atlantic States:								
Delaware	-------	-------	1	-------	99	61	1	0
Maryland [2]	7	2	64	74	659	199	5	13
District of Columbia	7	25	14	3	106	63	3	2
Virginia	12	16	-------	2,230	241	220	11	33
West Virginia	6	13	353	192	7	15	6	7
North Carolina	18	9	278	365	120	85	7	4
South Carolina	7	5	1,602	873	44	37	2	13
Georgia [3]	13	9	1,125	1,058	-------	-------	2	15
Florida	7	12	20	27	3	4	3	3
East South Central States:								
Kentucky	14	17	179	93	81	190	25	40
Tennessee	3	17	452	416	8	170	4	11
Alabama	9	17	2,019	2,224	33	22	20	2
Mississippi [2]	-------	9	-------	-------	-------	-------	5	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 13, 1937, and Mar. 14, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 13, 1937	Week ended Mar. 14, 1933	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936
West South Central States:								
Arkansas	2	8	260	383	--------	13	20	3
Louisiana	10	16	366	111	7	68	1	0
Oklahoma [4]	5	8	337	343	25	3	10	5
Texas [3]	54	44	2,099	880	420	475	10	11
Moun ain States:								
Montana	2	6	27	32	46	13	0	0
Idaho	1	--------	5	6	29	8	0	0
Wyoming	--------	4	--------	--------	4	4	0	1
Colorado	2	3	--------	--------	6	23	2	2
New Mexico	3	5	81	21	100	32	0	2
Arizona	2	6	73	316	181	57	0	1
Utah [2]	--------	--------	--------	--------	23	5	0	1
Pacific States:								
Washington	3	1	2	5	29	257	2	6
Oregon	--------	--------	34	218	7	385	1	1
California [3]	14	35	818	1,022	96	2,676	11	9
Total	450	536	11,131	12,393	7,342	11,626	210	312
First 10 weeks of year	5,506	6,302	235,680	74,364	52,676	77,758	1,628	2,213

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936
New England States:								
Maine	0	0	17	12	0	0	0	0
New Hampshire	0	1	19	11	0	0	1	0
Vermont	0	0	6	20	0	0	0	0
Massachusetts	0	0	256	301	0	0	2	2
Rhode Island	0	0	54	28	0	0	0	0
Connecticut	0	1	112	150	0	0	1	1
Middle Atlantic States:								
New York	0	3	1,020	1,326	0	0	6	16
New Jersey	0	0	232	653	0	0	2	1
Pennsylvania	0	1	749	533	0	0	6	6
East North Central States:								
Ohio	0	0	370	445	2	0	8	2
Indiana	0	0	238	286	0	4	0	1
Illinois	2	3	888	882	24	13	6	8
Michigan	0	3	1,004	384	1	2	2	8
Wisconsin	0	0	379	584	14	15	2	0
West North Central States:								
Minnesota	0	0	161	435	7	1	1	1
Iowa	1	0	370	233	38	11	1	1
Missouri	0	1	269	216	70	8	6	1
North Dakota	0	0	53	66	3	2	0	0
South Dakota	0	0	87	73	2	35	0	0
Nebraska	0	1	57	189	9	32	0	0
Kansas	0	1	492	347	32	79	2	1
South Atlantic States:								
Delaware	0	0	10	4	0	0	0	0
Maryland [2]	0	0	31	87	0	0	2	1
District of Columbia	0	0	9	24	0	0	0	0
Virginia	0	0	31	57	0	0	8	5
West Virginia	0	0	42	75	0	0	3	1
North Carolina	1	0	28	45	0	0	0	4
South Carolina	0	2	11	1	0	4	8	0
Georgia [3]	0	0	22	34	0	0	8	0
Florida	0	0	8	10	0	0	5	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 13, 1937, and Mar. 14, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936	Week ended Mar. 13, 1937	Week ended Mar. 14, 1936
East South Central States:								
Kentucky	1	0	46	50	0	0	5	2
Tennessee	0	0	18	50	0	0	3	3
Alabama	2	1	17	17	0	0	3	0
Mississippi [2]	5	0	13	16	0	0	0	3
West South Central States:								
Arkansas	1	1	12	15	5	2	2	2
Louisiana	0	0	9	14	0	7	13	9
Oklahoma [4]	0	0	34	25	3	1	4	2
Texas [3]	4	2	112	94	1	5	9	3
Mountain States:								
Montana	0	0	36	175	18	9	0	1
Idaho	0	0	19	38	1	3	0	1
Wyoming	0	0	19	159	2	0	0	0
Colorado	0	0	42	158	0	6	0	0
New Mexico	0	0	30	74	0	0	0	2
Arizona	0	0	4	20	0	1	0	1
Utah [2]	0	0	16	102	0	1	0	0
Pacific States:								
Washington	0	1	29	85	6	41	5	2
Oregon	0	0	24	25	36	1	3	0
California [3]	1	4	234	390	11	0	4	5
Total	18	26	7,739	9,018	285	283	116	91
First 10 weeks of year	221	184	65,463	78,017	2,942	2,173	1,101	949

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 13, 1937, 18 cases, as follows: Georgia, 14; Texas, 2; California, 2.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1937										
California	54	123	28,179	3	441	6	3	1,189	67	11
District of Columbia	9	60	147		194		0	75	0	2
Indiana	12	36	819		36		2	738	17	1
Iowa	6	17	587		11		2	1,166	140	1
Maine		5	2,929		54		0	101	0	2
New Jersey	16	38	408		3,847		1	659	0	9
Vermont	1	1	69		5		0	114	0	0
West Virginia	33	51	4,079		50		1	206	4	6

February 1937

	Cases
Botulism:	
California	6
Chickenpox:	
California	3,741
Indiana	380
Iowa	239
Maine	214
New Jersey	1,772
Vermont	186
West Virginia	210
Dysentery:	
California (amoebic)	3
California (bacillary)	1
Iowa (amoebic)	1
New Jersey (bacillary)	2
Encephalitis, epidemic or lethargic:	
California	2
District of Columbia	1
New Jersey	1
Food poisoning:	
California	12
German measles:	
California	118
Iowa	242
Maine	5
German measles—Continued.	
New Jersey	126
Vermont	8
Granuloma, coccidioidal:	
California	2
Jaundice, epidemic:	
California	2
Leprosy:	
California	1
Mumps:	
California	2,874
Indiana	85
Iowa	124
Maine	406
New Jersey	932
Vermont	150
West Virginia	71
Ophthalmia neonatorum:	
California	1
New Jersey	9
Paratyphoid fever:	
California	2
Rabies in animals:	
California	156
Indiana	30
New Jersey	16
West Virginia	5
Septic sore throat:	
California	9
Indiana	1
Tetanus:	
California	4
Trachoma:	
California	27
Trichinosis:	
California	3
New Jersey	4
Tularaemia:	
California	1
District of Columbia	8
New Jersey	1
Undulant fever:	
California	8
Iowa	6
Maine	3
New Jersey	4
Vermont	5
Vincent's infection:	
Maine	5
Whooping cough:	
California	1,489
District of Columbia	60
Indiana	209
Iowa	94
Maine	152
New Jersey	595
Vermont	121
West Virginia	306

CASES OF VENEREAL DISEASES REPORTED FOR JANUARY 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	976	3.44	435	1.53
Arizona	36	.93	102	2.64
Arkansas [1]	182	.91	142	.71
California	1,394	2.47	1,478	2.62
Colorado [2]				
Connecticut	221	1.29	138	.80
Delaware	146	5.70	41	1.60
District of Columbia	158	2.66	174	2.93
Florida	401	2.48	115	.71
Georgia	1,379	4.12	565	1.69
Idaho	17	.35	25	.52
Illinois	1,533	1.96	1,477	1.89
Indiana	230	.67	63	.18
Iowa [1]	131	.52	132	.52
Kansas	105	.57	54	.29
Kentucky [2]				
Louisiana	169	.80	134	.63
Maine [1]	54	.64	59	.70
Maryland	625	3.74	215	1.29
Massachusetts	510	1.17	618	1.41
Michigan	527	1.13	550	1.18
Minnesota	213	.81	297	1.13

See footnotes at end of table.

Reports from States—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Mississippi	1,831	9.34	2,318	11.82
Missouri	314	.80	202	.52
Montana [1]	59	1.11	43	.81
Nebraska	42	.31	71	.52
Nevada [3]				
New Hampshire	4	.08	9	.18
New Jersey	696	1.62	287	.67
New Mexico	39	.97	51	1.27
New York	7,109	5.52	1,794	1.39
North Carolina	1,873	5.48	589	1.72
North Dakota	33	.47	38	.54
Ohio [1]	1,051	1.57	341	.51
Oklahoma [3]				
Oregon	100	.99	183	1.82
Pennsylvania [4]	379	.38	170	.17
Rhode Island	86	1.26	48	.70
South Carolina	421	2.09	517	2.57
South Dakota	102	1.51	31	.46
Tennessee	723	2.49	355	1.22
Texas	407	.67	159	.26
Utah [3]				
Vermont	23	.61	25	.66
Virginia	644	2.44	372	1.41
Washington	284	1.74	398	2.44
West Virginia	210	1.16	108	.59
Wisconsin [5]	22	.08	89	.31
Wyoming [3]				
Total	25,459	2.12	15,012	1.25

Reports from cities of 200,000 population or over

Akron, Ohio	23	0.85	19	0.70
Atlanta, Ga.[3]				
Baltimore, Md	356	4.31	129	1.56
Birmingham, Ala	139	4.92	69	2.44
Boston, Mass	203	2.57	171	2.16
Buffalo, N. Y	44	.74	48	.81
Chicago, Ill	825	2.31	988	2.77
Cincinnati, Ohio [2]				
Cleveland, Ohio	179	1.92	83	.89
Columbus, Ohio	24	.79	9	.29
Dallas, Tex	101	3.49	65	2.24
Dayton, Ohio [2]				
Denver, Colo	31	1.04	38	1.28
Detroit, Mich.[3]				
Houston, Tex.[6]	121	3.61	49	1.46
Indianapolis, Ind	21	.56	36	.95
Jersey City, N. J.[3]				
Kansas City, Mo	52	1.23	10	.24
Los Angeles, Calif.[2]				
Louisville, Ky.[2]				
Memphis, Tenn	205	7.68	66	2.47
Milwaukee, Wis.[3]				
Minneapolis, Minn	69	1.42	149	3.06
Newark, N. J	221	4.77	83	1.79
New Orleans, La.[3]				
New York, N. Y	5,816	7.96	1,281	1.75
Oakland, Calif	17	.56	30	.99
Omaha, Nebr.[3]				
Philadelphia, Pa	205	1.03	56	.28
Pittsburgh, Pa.[2]				
Portland, Oreg.[3]				
Providence, R. I.[2]				
Rochester, N. Y	49	1.45	36	1.07
St. Louis, Mo	150	1.79	97	1.16
St. Paul, Minn	30	1.06	35	1.24
San Antonio, Tex.[3]				
San Francisco, Calif	115	1.71	136	2.03
Seattle, Wash	139	3.66	151	3.98
Syracuse, N. Y	67	3.07	36	1.65
Toledo, Ohio	36	1.18	19	.62
Washington, D. C.[7]	158	2.66	174	2.93

[1] Incomplete. [2] No report for current month. [3] Not reporting.
[4] Includes only those cases that enter the clinics conducted by the State department of health.
[5] Only cases of syphilis in the infectious stage are reported.
[6] Reported by the Jefferson Davis Hospital. Physicians are not required to report venereal diseases.
[7] Reported by the Social Hygiene Clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 6, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	252	764	140	6,076	1,000	2,557	20	419	21	1,397	-------
Current week	131	1,088	201	2,515	1,065	2,552	59	467	11	1,477	-------
Maine:											
Portland	0	1	0	0	2	1	0	1	0	3	23
New Hampshire:											
Concord	0	------	0	0	2	1	0	0	0	0	9
Manchester	0	------	9	0	5	0	0	2	0	0	51
Nashua	0	------	-------	0	1	2	0	-------	0	0	-------
Vermont:											
Barre	0	------	0	0	0	0	0	2	0	9	3
Burlington	0	------	0	0	0	0	0	0	0	1	7
Rutland	0	------	0	0	1	0	0	0	1	0	5
Massachusetts:											
Boston	1	------	3	2	38	44	0	5	0	100	238
Fall River	0	------	0	14	5	6	0	1	0	4	34
Springfield	0	------	0	15	4	6	0	1	0	7	46
Worcester	0	------	1	192	13	4	0	1	0	20	71
Rhode Island:											
Pawtucket	0	------	0	8	0	3	0	0	0	0	25
Providence	0	1	1	221	16	27	0	2	2	27	95
Connecticut:											
Bridgeport	0	1	0	23	4	24	0	0	0	3	33
Hartford	0	------	0	5	15	7	0	1	0	5	55
New Haven	0	------	0	1	1	6	0	0	0	1	44
New York:											
Buffalo	0	------	2	79	11	18	0	6	0	40	167
New York	38	56	13	173	228	430	0	110	1	85	1,790
Rochester	0	------	0	2	4	3	0	1	0	15	72
Syracuse	0	------	1	38	11	56	0	1	0	32	53
New Jersey:											
Camden	0	2	2	0	4	3	0	1	0	3	34
Newark	0	3	0	763	17	22	0	10	0	19	118
Trenton	0	------	2	3	4	19	0	0	0	9	36
Pennsylvania:											
Philadelphia	5	12	8	16	52	212	0	35	0	86	546
Pittsburgh	3	10	5	26	25	59	0	9	0	19	184
Reading	0	------	0	2	4	15	0	1	0	14	24
Scranton	0	------	-------	0	-------	28	0	-------	0	0	-------
Ohio:											
Cincinnati	0	4	3	0	13	41	0	7	0	11	162
Cleveland	2	50	8	17	24	56	0	11	0	70	213
Columbus	1	4	4	0	6	11	0	4	0	9	91
Toledo	0	4	4	38	8	7	0	3	0	28	84
Indiana:											
Anderson	0	------	0	0	4	8	0	0	0	0	8
Fort Wayne	1	------	2	0	5	3	0	3	0	1	37
Indianapolis	1	------	7	6	17	34	0	2	0	34	111
Muncie	0	2	2	0	1	9	0	0	0	0	-------
South Bend	0	------	0	0	4	2	0	1	0	2	26
Terre Haute	0	------	0	0	0	1	0	0	0	1	28
Illinois:											
Alton	0	------	0	0	0	4	0	0	0	0	8
Chicago	16	20	6	17	66	282	0	43	2	84	786
Elgin	0	------	0	0	3	1	0	0	0	4	11
Moline	0	------	1	0	0	0	0	0	0	8	8
Springfield	0	1	1	1	8	9	0	0	0	11	35
Michigan:											
Detroit	9	------	3	9	35	549	0	23	2	71	310
Flint	1	------	0	-------	5	27	0	0	0	0	27
Grand Rapids	0	------	0	18	7	8	0	0	0	13	34
Wisconsin:											
Kenosha	0	------	0	1	0	3	0	0	0	10	7
Madison	1	------	0	0	0	6	0	0	0	7	15
Milwaukee	0	3	3	1	12	73	0	2	0	45	119
Racine	0	------	0	1	0	7	0	0	0	2	16
Superior	0	------	0	0	2	3	0	0	0	1	8
Minnesota:											
Duluth	0	------	1	1	1	8	0	0	0	8	21
Minneapolis	1	------	0	5	7	26	0	2	0	22	88
St. Paul	0	2	2	2	7	22	1	0	0	86	74

City reports for week ended Mar. 6, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0	-----	-----	0	-----	3	0	-----	0	0	-----
Davenport	0	-----	-----	0	-----	4	0	-----	0	2	-----
Des Moines	0	-----	-----	0	-----	54	0	-----	0	2	43
Sioux City	0	-----	-----	0	-----	21	2	-----	0	1	-----
Waterloo	0	-----	-----	1	-----	25	0	-----	0	17	-----
Missouri:											
Kansas City	1	1	0	3	12	91	1	5	1	9	112
St. Joseph	0	-----	1	0	8	24	41	1	0	0	35
St. Louis	5	-----	3	2	18	78	1	13	1	90	231
North Dakota:											
Fargo	0	-----	0	0	0	7	1	0	0	0	7
Grand Forks	0	-----	-----	0	-----	0	0	-----	0	0	-----
Minot	0	-----	0	0	0	0	0	0	0	0	10
South Dakota:											
Aberdeen	0	-----	-----	0	-----	5	0	-----	0	0	-----
Sioux Falls	0	-----	0	0	0	0	0	0	0	0	8
Nebraska:											
Omaha	1	-----	1	0	4	5	1	1	0	5	51
Kansas:											
Lawrence	0	2	0	0	1	0	0	1	0	0	5
Topeka	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wichita	0	-----	0	0	2	9	8	1	0	3	24
Delaware:											
Wilmington	0	-----	0	16	8	1	0	4	0	3	44
Maryland:											
Baltimore	4	20	5	579	35	16	0	19	0	91	257
Cumberland	0	-----	0	0	0	1	0	0	0	3	9
Frederick	0	-----	0	3	0	0	0	0	0	0	4
District of Columbia:											
Washington	4	3	7	75	22	13	0	12	0	9	194
Virginia:											
Lynchburg	2	-----	3	10	4	1	0	0	0	4	12
Norfolk	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Richmond	2	-----	4	0	5	0	0	4	0	0	54
Roanoke	0	-----	0	33	4	0	0	1	0	3	17
West Virginia:											
Charleston	0	10	3	0	6	3	0	0	0	1	25
Huntington	1	-----	-----	0	-----	0	0	-----	0	0	-----
Wheeling	0	-----	0	0	4	3	0	0	0	5	24
North Carolina:											
Gastonia	0	-----	-----	0	-----	0	0	-----	0	1	-----
Raleigh	0	-----	0	0	1	0	0	0	0	1	13
Wilmington	0	-----	0	0	3	0	0	0	0	1	10
Winston-Salem	1	1	0	1	3	6	0	1	0	0	15
South Carolina:											
Charleston	0	130	2	0	6	5	0	2	0	0	39
Columbia	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Florence	0	-----	0	0	2	0	0	0	0	0	13
Greenville	0	-----	0	0	2	1	0	0	0	0	16
Georgia:											
Atlanta	1	81	5	0	16	3	0	8	0	3	116
Brunswick	0	-----	0	1	0	0	0	0	0	0	3
Savannah	3	74	5	0	6	0	0	1	0	1	37
Florida:											
Miami	2	11	1	0	1	2	0	3	1	3	45
Tampa	0	2	2	0	2	0	0	0	0	1	28
Kentucky:											
Ashland	0	13	-----	1	7	2	0	4	0	2	34
Covington	0	-----	1	2	1	1	0	0	0	2	18
Lexington	1	5	0	15	6	1	0	2	0	0	27
Louisville	2	-----	2	2	23	7	0	1	0	83	106
Tennessee:											
Knoxville	0	9	6	1	2	1	0	0	0	1	38
Memphis	0	-----	8	1	32	3	0	5	0	26	128
Nashville	0	-----	5	1	7	4	0	5	0	0	58
Alabama:											
Birmingham	0	197	7	0	8	1	0	6	0	7	91
Mobile	0	17	8	1	3	3	0	0	0	2	30
Montgomery	0	2	-----	0	-----	0	0	-----	0	0	-----
Arkansas:											
Fort Smith	1	-----	-----	0	-----	7	0	-----	0	0	-----
Little Rock	0	-----	3	0	5	6	0	1	0	1	9
Louisiana:											
Lake Charles	0	-----	1	0	6	0	0	0	0	0	10
New Orleans	4	38	10	2	24	2	0	16	1	0	165
Shreveport	0	-----	1	2	9	0	0	3	0	4	59

City reports for week ended Mar. 6, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Muskogee	0	------	0	0	0	1	0	0	0	0	1
Oklahoma City	1	90	2	0	10	8	0	1	0	0	53
Tulsa	1	------	--------	0	-------	9	0	-------	0	2	--------
Texas:											
Dallas	2	14	6	19	9	17	0	5	0	11	72
Fort Worth	1	------	2	57	14	9	1	2	0	2	51
Galveston	3	------	0	2	7	1	0	0	0	0	24
Houston	3	14	4	0	17	3	0	10	0	2	117
San Antonio	0	------	14	16	15	0	0	3	0	1	82
Montana:											
Billings	0	------	0	0	1	1	0	0	0	0	7
Great Falls	0	------	0	0	0	0	0	0	0	0	1
Helena	0	14	0	35	1	6	0	0	0	0	4
Missoula	0	------	0	0	1	1	2	0	0	0	7
Idaho:											
Boise	0	------	0	0	2	0	0	0	0	0	4
Colorado:											
Colorado Springs	0	------	0	1	1	3	0	1	0	0	14
Denver	2	------	1	1	7	17	0	4	1	73	99
Pueblo	0	------	0	0	5	0	0	0	0	3	13
New Mexico:											
Albuquerque	0	10	0	0	0	4	0	3	0	5	15
Utah:											
Salt Lake City	0	------	0	18	1	7	0	2	0	30	34
Nevada:											
Reno	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Washington:											
Seattle	2	------	1	5	2	2	0	5	0	8	104
Spokane	0	1	1	2	1	6	1	0	0	2	24
Tacoma	1	------	1	0	4	5	0	0	0	1	39
Oregon:											
Portland	0	3	0	0	2	5	1	5	0	1	73
Salem	0	6	--------	0	-------	1	0	-------	0	2	--------
California:											
Los Angeles	3	90	4	31	33	32	2	23	0	67	302
Sacramento	5	42	1	1	7	10	0	1	0	10	34
San Francisco	3	166	5	0	10	20	0	19	0	13	208

City reports for week ended Mar. 6, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	7	3	1
Springfield	2	0	0
Rhode Island:			
Pawtucket	1	0	0
Providence	1	2	0
New York:			
Buffalo	1	0	0
New York	8	4	0
Rochester	1	0	0
New Jersey:			
Newark	2	0	0
Pennsylvania:			
Philadelphia	1	1	0
Pittsburgh	1	3	0
Reading	1	0	0
Ohio:			
Cincinnati	2	1	0
Cleveland	1	0	0
Indiana:			
Indianapolis	1	2	1
Illinois:			
Chicago	5	2	0
Springfield	0	0	1
Michigan:			
Detroit	1	0	0
Minnesota:			
St. Paul	1	0	0
Iowa:			
Des Moines	0	0	2
Missouri:			
Kansas City	1	1	0
St. Joseph	1	0	0
St. Louis	1	0	0
Maryland:			
Baltimore	5	2	0
District of Columbia:			
Washington	0	0	1
West Virginia:			
Wheeling	0	1	0
North Carolina:			
Wilmington	2	0	0
Florida:			
Tampa	1	0	0
Kentucky:			
Ashland	0	2	0
Lexington	1	1	0
Tennessee:			
Knoxville	0	1	0
Memphis	1	1	0
Nashville	1	0	0
Alabama:			
Birmingham	1	3	0
Mobile	0	1	0
Louisiana:			
New Orleans	2	1	0
Shreveport	0	4	0
Oklahoma:			
Muskogee	1	1	0
Texas:			
Dallas	0	1	0
Fort Worth	0	1	0
Houston	3	0	0
Colorado:			
Denver	0	0	1
New Mexico:			
Albuquerque	1	1	0
Washington:			
Spokane	2	1	0
California:			
Los Angeles	1	1	1
Sacramento	0	0	2
San Francisco	2	2	0

Dengue.—Cases: Charleston, S. C., 2.
Encephalitis, epidemic or lethargic.—Cases: Philadelphia, 1; Pittsburgh, 1; Cleveland, 1; Baltimore, 1.
Pellagra.—Cases: Baltimore, 1; Charleston, S. C., 2; Savannah, 1; Montgomery, 1; Los Angeles, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended February 27, 1937.—During the 2 weeks ended February 27, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	2		1	2	4	1			1	11
Chicken pox		18	10	680	750	72	57	24	57	1,668
Diphtheria		3	6	95	11	3	5	2		125
Dysentery				5						5
Erysipelas				22	9	8	6	2	5	52
Influenza	3	214	486	9,443	3,226	3,679	528		1,968	19,547
Lethargic encephalitis				1						1
Measles		52	317	2,571	1,198	120	620	214	1,155	6,256
Mumps		4	417		877	25	51	13	82	1,469
Pneumonia	8	3			99		14		87	211
Poliomyelitis				2		1				3
Scarlet fever	1	27	10	359	292	90	105	134	43	1,061
Smallpox							1			1
Trachoma							1		3	4
Tuberculosis	1	25	18	246	89	15	2	2	25	423
Typhoid fever				64	3	1			1	69
Undulant fever				3						3
Whooping cough		9	3	455	179	61	20	10	9	746

NOTE.—Figures for Quebec are for the 4 weeks ended Feb. 27, 1937.

DENMARK

Notifiable diseases—October, November, and December 1936.—During the months of October, November, and December 1936, cases of certain notifiable diseases were reported in Denmark as follows:

Disease	October	November	December	Disease	October	November	December
Cerebrospinal meningitis	6	3	5	Paratyphoid fever	4	8	3
Chicken pox	15	21	35	Poliomyelitis	5	4	3
Diphtheria and croup	135	181	146	Puerperal fever	14	18	5
Epidemic encephalitis	2	1		Scabies	1,323	1,333	1,252
Erysipelas	311	325	312	Scarlet fever	1,283	1,118	901
German measles	14	6	14	Syphilis	84	63	60
Gonorrhea	890	827	781	Tetanus, neonatorum	5	8	5
Influenza	5,395	19,413	102,788	Tetanus, traumatic			1
Malaria	7	12	7	Typhoid fever	9	2	1
Measles	57	62	118	Undulant fever (Bact. abort. Bang)	51	44	42
Mumps	373	633	981	Whooping cough	1,899	1,909	2,108
Paradysentery	25	49	9				

SIAM

Cholera.—A report dated February 24, 1937, received from the American Consulate General at Bangkok, Siam, states that the cholera epidemic declined sharply in Bangkok during the week ended February 6 and in the country as a whole for the week of February 20. Since the beginning of the epidemic in December 1936, there have been reported 2,030 cases, with 1,255 deaths.[1] Decreases in the number of cases and deaths were reported in February, although the number of infected districts increased in the three weeks ended February 20 from 57 to 78.

SWEDEN

Notifiable diseases—January 1937.—During the month of January 1937, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Poliomyelitis	[a] 60
Diphtheria	23	Scarlet fever	1,093
Dysentery	14	Typhoid fever	8
Epidemic encephalitis	1	Undulant fever	16
Paratyphoid fever	8	Weil's disease	1

[a] Includes 5 cases nonparalytic at time of notification.

[1] See table, p. 373, for reports by weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan-American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936: 5	12	19	26	January 1937: 2	9	16	23	30	February 1937: 6	13	20
Afghanistan	C			P													
Ceylon: Batticaloa	C			3													
India	C	25,973	19,883	20,423	23,017	7,196	6,303	2,856	1,610	4,921	4,585	3,817					
	D	12,681	9,785	9,520	11,747	3,742	3,335	1,570	859	2,733	2,660	2,118					
Assam	C	293	289	368	710	178	209		277	343	102	57	44	39	82	34	29
	D	180	158	184	318	87	85		143	191	67	30	19	23	30	19	12
Bassein	C	1															4
Bombay Presidency	C	3,597	2,970	4,281	2,359	1,131	701	484	321	283	83	76					
	D	1,500	1,378	1,575	1,120	589	409	284	185	151	54	43					
Bombay	C		[1] 1	[2] 1		1	1										
Calcutta	C	103	54	73	61	19	18	15	9	17	11	18	23	19	26	14	
Central Provinces and Berar	C	5,730	4,363	4,239	922	107	155	113	192	52	69	3		1			
Chittagong	C	3	6	2	16	8			3	2				1	1	1	
Madras Presidency	C	5,478	4,607	6,271	10,204	2,331	1,705	1,552		1,860	2,008	2,230					
	D	2,587	2,336	3,143	5,161	1,168	915	802		935	1,127	1,162					
Madras	C		8	21	57	41	19			21	21	11	14	8	6	12	4
	D	1	1	6	12	14	7			8	10	6	9	8	2	9	2
Negapatam	C	24	9						11	4	11	4	1	2	3		1
	D	10	5						7	4	7	1		1	1		
Northwest Frontier Province	C				84	4	1		2								
Orissa Province	C				155	170	329	307	188	183	208	192	130	176	163	144	168
Punjab	C	652	169	18	7												
Rangoon	C	3		4	4	2						1			1		
Sind State	C	20	38														
Tuticorin	C				12	3											
India (French):																	
Chandernagor Territory	C								5	5	3						
Karikal Province	C	98	25	69	4	11	38	20	27	23	22	15	26				
Pondichery Province	C	1	4		10												13
Indochina (see also table below): Cochinchina—																	
Cholon Province	C												1				
Vinlong	C							1									

Siam:																	
Bangkok	C	1							2	7	8	19	54	62	52	40	37
Provinces	C	117	57	18		12	29	63	92	101	119	169	221	245	252	385	305

Place		September 1936			October 1936			November 1936			December 1936			January 1937		
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31
Indochina (French) (see also table above):																
Cambodia [3]	C	2	2								1					
	D	2	1								1					
Cochinchina [3]	C	1			1				1			1				1
	D	1			1				1			1				1

[1] Suspected.
[2] Imported.
[3] Reports incomplete.

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		July 26-Aug. 29, 1936	Aug. 30-Sept. 26, 1936	Sept. 27-Oct. 31, 1936	Nov. 1-28, 1936	Week ended—												
						December 1936				January 1937					February 1937			
						5	12	19	26	2	9	16	23	30	6	13	20	27
Algeria:																		
Algiers	C						[2] 1											
Plague-infected rats				2														
Oran Department	C	[2] 2	[2] 2															
Philippeville	C	[2] 1																
Argentina. (See table below.)																		
Belgian Congo	C			[2] 2														
Brazil (see also table below):																		
Santos	C	4																
	D	1																
Sao Paulo.[3]																		

[1] Including plague in the United States and its possessions.
[2] Suspected.
[3] A report dated July 29, 1936, states that 23 cases of pneumonic plague with 18 deaths were reported in Sao Paulo, Brazil.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936: 5	12	19	26	January 1937: 2	9	16	23	30	February 1937: 6	13	20	27
British East Africa:																		
Kenya	C	25	14	16	18	4	1	3			10	7						
Tanganyika	C																19	
Uganda	C	97	87	81	85	15	19	14	4	4	6	9	8	9				
	D	91	78	79	76	15	18	13	4	4	6	7	8	9				
Ceylon:																		
Colombo	C	1	1	3	4	1			2	1			1	1	3	4	2	
	D		1	1	3	1			2	1			1	1	3	3	2	
Plague-infected rats		1	1	7	1	1			3				3	9		6	9	
Southern Province	C	1																
China: Manchuria.[4]																		
Dutch East Indies: West Java	C	410	382	391	317	110	129											
	D	408	374	391	315	110	129											
Ecuador:																		
Alausi	C		1															
Babahoyo	C				5			2		1	2							
Plague-infected rats					6													
Bajada del Morro	C			3	4													
Guayaquil	C	4	2	5	21	5	2	6		2	5		3	7	9	5	2	10
	D	1	3	1	14	2	2	9		1	4		2	4	5	5	3	3
Plague-infected rats		4	6	4	7	3	1	4					4	6	7	9	3	14
Playas	C						7	4		1								
Egypt:																		
Alexandria: Plague-infected rats		P	P	P	P													
Asyut Province	C		4	3	1				2	1	1					1		
Beheira Province	C			1														
Girga Province	C			1	1													
Formosa: Taihoku District	C						1											
France: Marseille [6]	C	1	2															
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District: [7]																		
Hamakua Mill Sector [7]				2														
Kukaiau										1								
Paauhau Sector [7]		6	22	12	3	1	3	1		2	1			6	2	2	2	
Pohakea [7]																		
Maui Island—Wailuku District—Keahua Region				1														

India	C	900	1,172	2,292	2,335	725	623	905	776	1,207	1,611	754						
	D	531	430	684	717	200	240	344	315	396	481	389						
Bassein	C	5			1	1					1	1	1		1		4	
Plague-infected rats		1	1	1														
Bombay Presidency	C	10	72	109	57			42	39	27	43	29	27	43	29			
	D	6	45	66	35			21	15	26	26	18	26	26	18			
Central Provinces and Berar	C	147	528	1,445	1,378	449	322	426	404	456	817	270	193	286	235	388	351	
Karachi	C														1	4	1	
Madras Presidency	C	154	63	48	29	47	27	57		21	25	25						
	D	86	55	25	15	30	22	28		18	5	15						
Rangoon	C	3		1						1		2					1	
Plague-infected rats		4	3															
Sind State	C															5		
Indochina (see also table below):																		
Bentre	C									1								
Pnom-Penh	C	4																
Iraq: Baghdad Province	C			1														
Madagascar. (See table below.)																		
Malta	C	4	3	[5] 3	6						2	2		2				
	D	1									1							
Northern Rhodesia	C												8					
Peru. (See table below.)																		
Senegal. (See table below.)																		
Tunisia: Tunis	C	2		5	1				1									
Plague-infected rats		2							3	1								
Union of South Africa (see also table below)	C	4	6	3	3	[8] 5				[8] 2						[8] 3		[8] 1
United States:																		
California:																		
Eldorado County—Plague-infected chipmunk				1														
Modoc County—Plague-infected squirrels		10																
Monterey County.[9]																		
Placer County.[9]																		
San Bernardino County.[9]																		
Utah:																		
Beaver County—Plague-infected marmots		2																
Garfield County[10]—Plague-infected prairie dogs		2																
Sevier County.[10]																		

[3] Suspected.

[4] A report dated Aug. 20, 1936, states that 5 cases of plague were reported at Kirin Province, Manchuria, China.

[5] Includes 1 case of pneumonic plague.

[6] A report dated Sept. 3, 1936, states that 2 plague-infected rats were reported in Marseille, France.

[7] Plague-infected rats have been reported in Hawaii Territory, Hawaii Island, Hamakua District, as follows: Locality not specified, week ended Aug. 8, 2 plague-infected rats; Paauhau Sector, week ended Mar. 6, 1937, 1 plague-infected rat; week ended Mar. 13, 1937, 2 plague-infected rats; week ended Mar. 20, 1937, 1 plague-infected rat; Hamakua Mill Sector, week ended Mar. 20, 1937, 1 plague-infected rat; Pohakea, week ended Mar. 20, 1937, 1 plague-infected rat.

[8] For 2 weeks.

[9] Plague-infected fleas have been reported in California as follows: Aug. 18–21, 104 plague-infected fleas collected from ground squirrels in San Bernardino County, and according to information dated Nov. 10, 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley, also in San Bernardino County, have been proved positive for plague. A report dated Oct. 13, 1936, states that fleas from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague-infected.

[10] Plague-infected fleas in Utah have also been reported as follows: Aug. 24, 45 fleas taken from 23 prairie dogs in Garfield County, and July 28, 1936, 315 fleas taken from 11 ground squirrels in Clear Creek Canyon, Sevier County.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936: 5	12	19	26	January 1937: 2	9	16	23	30	February 1937:	13	20	27
On vessels:																		
S. S. *Ipanema* at Marseille from Bone and Philippeville	C	1																
S. S. *Delambre* at Liverpool from Montevideo, Buenos Aires, Rosario, Santos, and Las Palmas—Plague-infected rats			2															

Place		August 1936	September 1936	October 1936	November 1936	December 1936	January 1937
Argentina:							
Buenos Aires—							
Plague-infected rats				4			
Catamarca Province	C			1			
Cordoba Province	C				4	5	
Salta Province	C						10
San Luis Province	C					1	
Santiago del Estero Province	C		[9] 2				
Tucuman Province	C		[11] 6				
Brazil (see also table above):							
Bahia State	C	[12] 46					
Ceara State	C	[12] 106					
Pernambuco State	C	[12] 45					
Piauhy State	C	[12] 4					
Indochina (see also table above):							
Cambodia	C	8				1	
Cochinchina	C	1				1	1
Madagascar (central region)	C	83	104	160	186	176	
	D	81	95	154	174	167	
Peru	C	6	8	16	33	16	23
Cajamarca Department	C				9		
Lambayeque Department	C		3	1	3	1	2
Libertad Department	C	1	1	6	19	14	15
Lima Department	C	2	2	9	2	1	4
Callao. Plague infected rats		P	P				
Piura Department	C	3	2				2
Senegal: Tivaouane [13]	C	4					
Union of South Africa (see also table above)	C		21	11	5	2	

[9] Includes 1 case of pneumonic plague.
[11] Pneumonic plague.
[12] From Jan. to Aug. 31
[13] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936 5	Dec. 12	Dec. 19	Dec. 26	January 1937 2	Jan. 9	Jan. 16	Jan. 23	Jan. 30	February 1937 6	Feb. 13	Feb. 20	Feb. 27
Algeria:																		
Algiers Department	C												2					
Philippeville	C	1																
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia	C	43	99	99	38	6	6	7	1									
Porto Alegre (alastrim)	D	2	1	4		1												
Recife (alastrim)	C			3	3	2		12	1									
British East Africa: Tanganyika	C	94	74	453	207	4				151				81				
British Somaliland	C	2																
Canada:																		
Alberta	C	[1] 1			4		[1] 4						2	1		[1] 46		
British Columbia	C													[1] 1				
Saskatchewan	C	[1] 1														[1] 1		
Ceylon: Colombo	C	1		1														
China (see also table below):																		
Amoy	C											3						
Canton	C					1	1											
Dairen	C	2						1				2						
Foochow	C	P	P		P				P		P		P					
Hangchow	C		1						1	2	2	1						
Hankow	C					2	2		1			2	3					
Hong Kong	C		1									2	4	1		2	1	2
Nanking	C			1	1	1	1	1				1						
Shanghai	C	9		7	24	14	19	42	23		38	57	51	53		19	40	28
Tientsin	C			2	1	2	1	1				1						
Chosen. (See table below.)																		
Colombia	C	126	[2] 76	84														
Barranquilla	D	6	1	1	3		5	2		1		3						
Dutch East Indies: Surabaya	C													[3] 1				
Ecuador: Guayaquil	C	1	1	3	8					6	1		1	2	5	8	8	12

[1] For 2 weeks.
[2] For 3 weeks.
[3] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936 5	Dec. 12	Dec. 19	Dec. 26	January 1937 2	Jan. 9	Jan. 16	Jan. 23	Jan. 30	February 1937 6	Feb. 13	Feb. 20	Feb. 27
Egypt: Alexandria	C				[1] 1													
Eritrea. (See table below.)																		
Ethiopia	C				13													
Finland	C	8																
France. (See table below.)																		
Great Britain: England and Wales—																		
Lancaster—Failsworth	C											2						
London and Great Towns (Oldham)	C				1	2	5											
Greece: Salonika	C			40	34	8	10	10	10	10								
Guatemala. (See table below.)																		
India	C	5,419	3,413	2,388	3,559	1,300	1,558	985	762	1,658	2,268	2,118						
	D	1,478	886	582	868	304	385	264	183	400	584	543						
Assam	C	79	70	64	36	20	37		35	20	47	64	44	37	47	78	60	
Bassein	C									6	12							
Bombay Presidency	C	510	258	183	116	53		43	35	34	57	102						
	D	100	46	41	27	6		4	11	15	9	13						
Bombay	C	39	17	11	3	1	2	2	2	4	3	2	10	6	8	17	11	
	D	28	14	6	3			2	1	5	1	3	4	4	6	7	7	
Calcutta	C	45	6	12	8	3	3	1	2	3	4	5	8	9	13	17		
	D	39	8	7	2	2	1	3	1	1	2	3	4	2	7	11		
Central Provinces and Berar	C	187	70	46	38	19	38	11	47	6	36	21	59	83	53	97	81	
Chittagong	D			3	[3] 2	2	6		2	48	46	38	48	57	67	62	91	
Cochin	C		2															
Karachi	C				[3] 1				3	2	10	11	9	8	8	9	14	
Madras Presidency	C	1,122	442	470	298	69	66	26		71	131	168						
	D	205	96	96	59	11	17	9		11	34	27						
Madras	C	2	3	1	3	6	1						1	2	4	6	13	
Moulmein	C	10	12	3	12	13	1	8	9		12	13	10	13	14	19	16	
Northwest Frontier Province	C	7	22	14	15	13	13		21	20	11	35	24	35	12	27	23	
Orissa Province	C					49	121	75	131	130	146	187	81	137	226	289	275	
Punjab	C	52	65	77	294	59		73	188	117	111	109	101	95	95	168		
Rangoon	C	5	1	10	11		1		[3] 1	2	[3] 1	1		[3] 1	5	3	5	
Sind State	C	31	51	21	52	35	60		42	9	55	42	60	29	36	73	22	
Vizagapatam	C	2		1											1			
India (French): Pondichery Province	C	1																

India (Portuguese)	C			[illegible]				1	1									
Indochina (see also table below):																		
Pnom-Penh	C	1	7	4	5		1											
Saigon-Cholon	C										2				2			
Tourane	C											3			1			2
Iran	C	6	9	2	1		1				1	1	3	6	3			
Teheran	C	3	4	4	2		1								2			
Iraq	C	1		3	6		30				1					1		
Baghdad	C	1																
Japan:																		
Osaka	C	11	21	16														
Tokyo	C				1													
Yokohama	C															1		
Mexico (see also table below):																		
Chihuahua	C														[4] 3			
Durango	D					1				1			1				1	
Guadalajara	D	2	1															
Mexico, D. F.	C	7		1	2	1			1	1		3		3				
Monterrey	C												2		4	1	5	1
Torreon	C		3	13	2			2	1	8	1	1	10	11			2	5
Morocco. (See table below.)																		
Nicaragua: Puerto Cabezas	C																	2
Nigeria	C	34		98	12	[1] 11					15							
Lagos	C	1	1	1														
Northern Rhodesia	C				91													
Palestine. (See table below.)																		
Peru. (See table below.)																		
Poland	C														1			
Portugal (see also table below):																		
Lisbon	C	2	1									2				1		
Oporto	C	1	1											1				
Siam: Tak Province	C																26	
Sierra Leone	C	3	[1] 38	28	16	[1] 20		[1] 18		[1] 9		[1] 8						
Freetown	C						3											
Southern Rhodesia	C			P			10											
Sudan (Anglo-Egyptian)	C	13	105	96	113	71	11	26	8	17	15			5	18	23	12	22
Tunisia	C		1								1				2			
Turkey. (See table below.)																		
Union of South Africa	C	P																
Uruguay. (See table below.)																		

On vessels:
S. S. *Palamba* at Rangoon from Calcutta — 1 case — Aug. 11, 1936
S. S. *Jaldurga* at Rangoon from Gopalpur — 1 case — Dec. 30, 1936
S. S. *Egra* at Rangoon from Calcutta — 1 case — Jan. 4, 1937
S. S. *Tango Maru* at Singapore from Japan — 1 death — Jan. 16, 1937

On vessels—Continued.
S. S. *Juna* at Rangoon from Penang — 1 case — Jan. 27, 1937
S. S. *Horai Maru* at Moji from Keelung — 2 cases — Jan. 28, 1937
S. S. *Colorado Springs* at Manila from Shanghai — 1 case — Feb. 1, 1937
S. S. *Nikko Maru* at Moji from Tsingtao — 1 case — Feb. 7, 1937

[1] For 2 weeks.
[3] Imported.
[4] For 7 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		August 1936	September 1936	October 1936	November 1936	December 1936	January 1937
Angola	C	143	153				
Argentina:							
Chaco Territory	C	1					
Corrientes Province	C	6	3	1		1	
Entre Rios Province	C			154	18		
Jujuy Province	C	1					
Los Andes Territory	C			12			
Salta Province	C			31		2	
Santa Fe Province	C		2				
Belgian Congo	C	88	105	110	117	93	
Bolivia	C	12					
Chosen	C	10	3	2			
Eritrea	C		2			1	
Finland	C					1	1
France	C	2		1	10		
Guatemala	C	13	1	1	1	4	5
Indochina (see also table above)	C	119	87	39	159	219	306
	D	21	8	12	33	38	84

Place		August 1936	September 1936	October 1936	November 1936	December 1936	January 1937
Mexico (see also table above):							
Chihuahua State—Chihuahua	C	1	1				
Colima State	C		1				
Jalisco State—Guadalajara	C	3	3				
	D	1	1				
Mexico State	C			1			
Mexico, D. F.	C	5	1	6			
Mexico City	D		1	1	2		
Puebla State—Puebla	C		2				
Queretaro State	C						
Sonora State	C			1			
Morocco	C	2	1			2	
Nyasaland	C				5		
Palestine	C						2
Peru	C	74	23	24	13		
Portugal (see also table above)	C	43	83	82	126		
	D	3	4	7	5		
Uruguay	C		1				

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936				December 1936				January 1937					February 1937		
					7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20
Algeria:																				
Algiers Department	C	24		3				4	1		[1] 3	13	3	9		[1] 49	10		[1] 68	
Algiers	C	1		1		1		3				1				1			[1] 2	
Constantine Department	C	42	1	10	6	4	11	15	20		[1] 48	30		19		[1] 94	46		[1] 98	
Bone	C							1								[1] 1	1		[1] 10	
Constantine	C	2	1		1	1		1			[1] 3									
Philippeville	C										1					[1] 4	2			
Oran Department	C	2		1									2			[1] 4	4			
Southern Territories	C																5		3	
Australia: Sydney	C					1														
Basutoland	C		7																	
Bolivia. (See table below.)																				
Bulgaria	C	1																		
Ceylon: Colombo	C			1																
Chile	C	508	543	577	105	157														
Santiago	C	[2] 87	83	[2] 152																
Valparaiso	C	3	1	6				12	14	3	3	1	2		2	4	2	2	1	3
China:																				
Dairen	C			2	1					3	1									
Hankow	C												1	1						
Shanghai	C		2	2																
Tientsin	C	1		1																
Tsingtao	C	2									3									
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	2		2								1	1			4	5	1	5	3
Aswan Province	C		1																	
Asyut Province	C	4		1														1		
Beheira Province	C	1											1	7				24		
Cairo	C	1		4	1															1
Dakahliya Province	C																	5		
Faiyum Province	C										1		1							
Gharbiya Province	C	8		2							3			5				8		
Girga Province	C	2								2										

[1] For 2 weeks.
[2] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936 7	14	21	28	December 1936 5	12	19	26	January 1937 2	9	16	23	30	February 1937 6	13	20
Egypt—Continued.																				
M.nufiya Province	C	2											1					5		
Minya Province	C												1					19		
Port Said	C										1	1	3	2		2	1	1		
Sharkiya Province	C	4											1							
Suez	C	1																		
Provinces	C	30	5	12	3	3	3	6		2	4	8	6	13	25	49	21	62	19	69
Eritrea: Asmara	C														13		1		1	
Finland. (See table below.)																				
France. (See table below.)																				
Greece (see also table below): Salonika	C	4	4	5	1	1	1	1	1	1	1	1	1							
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	3	7	12		2	5		1		1		2	1	2					
Hungary	C		1																	7
Iran	C	4	11	3		1		1		3	1						7			
Teheran	C		2							1					2					
Iraq: Baghdad	C														1					
Irish Free State: Kerry County[3]—Dingle	C	2	3	2																
Italy: Catania	C					1														
Lithuania. (See table below.)																				
Mexico (see also table below):																				
Durango	D	1																		
Mexico, D. F.	C	20	23	16		4	2	1	2	1		1	6	4			2			
Saltillo	D			1																
San Luis Potosi	D						1			1			1	1						
Torreon	C		1	2																
Morocco (see also table below)	C	1									1		1	2	1		1	6	6	
Palestine:																				
Haifa	C	13	16	10	2	3		2	3	2	3	3		1		1	1		1	
Jaffa	C	13	23	12	6	1				4	4		1		1					
Paraguay: Asuncion	D	3	1																	
Peru. (See table below.)																				
Poland	C	49	47	63	15	34	46	36	53	40	49	33	49	58	77	87	128	88	88	
	D		3		1	1	1	3	5	2	2	4	4	6	2	5	5	6	5	

Portugal. (See table below.)																				
Rumania. (See table below.)																				
Sierra Leone: Freetown	C				1															
Straits Settlements: Singapore	C		3										1							
Sudan (Anglo-Egyptian)	C										8									
Trans-Jordan	C																			3
Tunisia:																				
Tunis	C	1	2	2			3						1	2	2		2	2		
Provinces	C	21	19	27	6	2	23	12		48	6		[1] 54	41	73	46		50		
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				

Place		August 1936	September 1936	October 1936	November 1936	December 1936	January 1937
Bolivia	C	29					
China: Manchuria—Harbin	C	3	4		1		
Chosen	C	20	24	24	30		
Czechoslovakia	C	1	1			3	
Finland	C	1	1				
France	C				1	1	
Greece (see also table above)	C	10	9	11	11	2	
Guatemala	C	30	38	17	33	28	29
Lithuania	C						13
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C	3	1	2			
Chihuahua State	C		1				
Durango State	D	1					
Guanajuato State	C	7					
Jalisco State: Guadalajara	C	1	1				
Mexico State	C	10	4	18			
	D	2		1			
Mexico, D. F.	C	19	21	14			
Mexico City	D		8	7	2	5	

Place		August 1936	September 1936	October 1936	November 1936	December 1936	January 1937
Mexico (see also table above)—Continued.							
Oaxaca State	C	4	2	2			
Puebla State: Puebla	C	10	6	2			
Queretaro State	C	1	1	3			
San Luis Potosi State: San Luis Potosi	C	4	1	1			
Morocco (see also table above)	C	2			1	2	11
Peru	C	67	48	80	60		
Portugal	C	1	2				
Rumania	C	32	25	60	178	380	
Turkey	C	15	27	21	18	21	24
Istanbul	C	1	1	3	4	1	4
Union of South Africa:							
Cape Province	C	113	43	75	74	61	
Natal	C			7	19	4	
Orange Free State	C	15	14	43	9	8	
Transvaal	C		1	4	11	6	
Yugoslavia	C	16	6		7	49	148

[1] For 2 weeks.

[3] During the week ended Feb. 27, 1937, 4 cases of typhus fever were reported in Caherciveen, Kerry County, Irish Free State.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 26–Aug. 29, 1936	Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Week ended— November 1936 7	14	21	28	December 1936 5	12	19	26	January 1937 2	9	16	23	30	February 1937 6	13	20
Belgian Congo.[1]																				
Brazil:																				
Matto Grosso State	C									1										
	D												2		1			1		
Minas Geraes State	C																1	1		2
Parana State	C															1	3		1	
Sao Paulo State	C																			
Colombia [2]	C										3									
	D	3	3								1									
Barrancabermeja	C																	1		
Cundinamarca Department	D	1																		
Intendencia of Meta—																				
Acacias	D					1														
Quenane	C			1																
Restrepo [2]	D	2	1	2																
Villavicencio [2]	D		1	2																
Santander Department [2]	D	4	1																	
Dahomey	C		2			1														
French Equatorial Africa: Libreville	D																		[3] 1	
French Guinea—Macenta	C		[4] 2	1																
Gold Coast:																				
Accra	C															4	1	1	2	
Tamale	C										1									
Teshi	C															1				
Ivory Coast: Adzope	C																			3
Nigeria:																				
Aba	C		[3] 1																	
Calabar	C					1														
Ilorin Province	D		[3] 1																	
Kano	C	[3] 1																		
Maiduguri	D				1															
Uyo	C											1								

Senegal:																				
Bambey	C						1													
Khombole	C			1	1															
M'Bour	C							[3] 1												
Thies	C			[3] 1				[3] 1												
Tivaouane	C		1																	
Sierra Leone	C		[3] 1	1																
Freetown.[5]																				
Sudan (French):																				
Katibougou	C			1																
Koulikoro	C		1	2																
Segou	C			1																
On vessel: [6] S. S. *Sea Rambler* in River Tyne from Dakar	C		14																	
	D		7																	

[1] Information dated Jan. 23, 1937, states that the suspected fatal case of yellow fever reported Dec. 22, 1936, at Mangembo, Belgian Congo (p. 123 of PUBLIC HEALTH REPORTS of Jan. 22, 1937) has not been confirmed.

[2] Yellow fever has also been reported in Colombia, as follows: Restrepo, June 4 to July 30, 7 deaths; Villavicencio, January, June, and July, 6 deaths; Santander Department, June and July, 6 deaths.

[3] Suspected.

[4] Includes 1 suspected case.

[5] Information dated Jan. 7, 1937, states that the suspected case of yellow fever reported Nov. 16, 1936, at Freetown, Sierra Leone (pp. 1731 and 1815 of PUBLIC HEALTH REPORTS) has not been confirmed by the protection test.

[6] For a detailed report see p. 336 of PUBLIC HEALTH REPORTS of Mar. 19, 1937.

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UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

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PUBLIC HEALTH REPORTS

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STUDIES OF SEWAGE PURIFICATION

VI. BIOCHEMICAL OXIDATION BY SLUDGES DEVELOPED BY PURE CULTURES OF BACTERIA ISOLATED FROM ACTIVATED SLUDGE

By C. T. Butterfield, *Principal Bacteriologist*, C. C. Ruchhoft, *Principal Chemist*, and P. D. McNamee, *Assistant Chemist, United States Public Health Service, Stream Pollution Investigations, Cincinnati, Ohio*

The research studies of the activated sludge process of sewage purification being carried on by the Stream Pollution Investigations laboratory of the United States Public Health Service at Cincinnati, Ohio, under the direction of Senior Sanitary Engineer J. K. Hoskins, include an investigation of the fundamental mechanism of the process. During recent years there has been intensive study of the activated sludge method of sewage treatment and many theories of the fundamental mechanism of the process have been proposed. In our studies of the total purification accomplished by activated sludge treatment, those portions of the purification which, after various periods of aeration, may be ascribed to (1) biochemical oxidation and (2) adsorption, which necessarily includes material utilized for the synthesis of new sludge solids, have been investigated. A study has also been made of those biological, chemical, and physical factors which facilitate or deter these basic phenomena of the process of total purification.

To avoid confusion due to involved results, each individual report insofar as possible will deal with only one such phase of the process and the data relative thereto. The present report will be confined to observations regarding the biochemical oxidation of organic matter occurring in sterilized natural sewage and in synthetic sewage when treated with active sludges developed by pure cultures of bacteria isolated from treatment plant activated sludge. In this report it will be shown that bacteria isolated from normal activated sludge can be made to reproduce similar sludge in pure culture and that this pure culture sludge exhibits oxidation characteristics similar to those of normal activated sludge.

Review of literature.—Edwards (1) has reviewed activated sludge theory and Theriault (2) has recently presented considerations on the rate and mechanism of sewage clarification. Streeter (3) summarized the work on rates of natural oxidation and showed that the

oxidation reaction is proportional to the biochemical oxygen demand and follows the equation expressed by Theriault (4),

$$X_t = L\ (1-10^{-Kt}) \qquad (1)$$

where

X_t = the B. O. D. oxidized in time t.
L = the initial total B. O. D.,
and K = a velocity constant of 0.1 at 20° C.

This low rate biochemical oxidation reaction has been assumed to hold for all sewage-sludge oxidation reactions. Higher rates of biochemical oxidation have not been demonstrated conclusively up to the present time, and observations indicating higher rates of oxidation usually have been ascribed to immediate or chemical demand.

The first study of rates of oxygen absorption by activated sludge was published by Grant, Hurwitz, and Mohlman (5). In this pioneer work the authors concluded that the rate of oxygen absorption for activated sludge was fairly uniform, that the rate was proportional to the organic (volatile) matter of the sludge, and that this rate for Chicago, North Side, activated sludge averaged about 7.0 milligrams of oxygen per gram of sludge per hour. They calculated the oxygen absorbed required to oxidize sewage by subtracting mean oxygen absorption values for activated sludge alone from the corresponding values for sludge plus sewage.

Theriault and McNamee (6) determined the rate of disappearance of oxygen in a sludge taken from an artificial stream channel and aerated in a closed system. It was found that the rate of oxidation for this sludge was much higher than could be accounted for by the biochemical oxidation rate in diluted sewage or natural waters. This high rate of oxidation was explained by them on the basis of two simultaneous unimolecular reactions, the first of these representing the normal biochemical oxygen demand and the second the so-called "immediate" oxygen demand. The expression representing the *reaction* is:

$$Y = L_1\ (1-10^{-K_1t}) + L_2\ (1-10^{-K_2t}) \qquad (2)$$

where

Y = the oxygen demand in time t in days,
L_1 and L_2 = constants for the total first stage demand, due respectively to biochemical oxidation and immediate demand,
K_1 = the velocity constant for the normal biochemical demand, equals 0.1,
and
K_2 = the velocity constant for the immediate demand.

The higher rate oxidation (L_2) in these experiments was practically complete in 20 hours and represented about 20 percent of the total first stage demand (L_1+L_2). The authors tentatively ascribed this high rate "immediate" demand to enzymatic action, and ruled out

the possibility that it might be due to a high rate biochemical oxidation reaction.

Kessler and Nichols (7), using a dilution method and short periods of observation (6 to 10 minutes), showed that the deoxygenation rate of sewage-activated sludge mixtures decreased rapidly during the first few hours. They observed that the maximum rate of deoxygenation of these mixtures was apparently dependent upon the sewage strength (B. O. D.). Furthermore, using Nordell's original empirical expressions, they found a fairly constant relation between the total oxygen used at the maximum rate by activated sludge-sewage mixtures and the 5-day B. O. D. of the sewage being treated by a given activated sludge. The factor for this relation varied from 6.0 to 13.0 for various activated sludges. This is an important observation, because it suggests that the deoxygenation reaction in sewage-activated sludge mixtures is a biochemical one in which the sludge organisms are the agents that oxidize sewage organic matter at rates very greatly increased over those which occur in sewage alone. The experiments of Wooldridge and Standfast (8), also reported by Topley (9), showed that, when sewage was added to activated sludge, there was an increase in the rate of oxygen absorption over that observed in activated sludge alone or in sewage alone. These experiments also indicate a more rapid biochemical oxidation of sewage organic matter by activated sludge than occurs in diluted sewage or in streams.

Goldthorpe (10) obtained rates of oxygen absorption by activated sludges from 0.021 to 0.173 milligrams of oxygen per gram of sludge per minute. In three experiments he determined the oxygen used by the sludge alone and immediately afterward the oxygen used by the sludge diluted with tank effluent. The data obtained were as follows:

Milligrams of O_2 absorbed per minute per gram of sludge

Experiment number	*4*	*5*	*6*
Sludge+tank effluent (1:2)	0.173	0.095	0.124
Sludge alone	.0259	.029	.023
Number of times rate was increased by addition of tank effluent	6.7	3.28	5.4

This illustrates the importance of the liquid substrate B. O. D. upon the rate of oxygen utilization of the sludge mixture. Goldthorpe's Huddersfield reaerated concentrated sludges apparently have very little dissolved food material in their liquid substrate. Consequently their rates of oxygen absorption are very low. When tank effluents, which still have considerable B. O. D. or dissolved organic food material present, are added to these sludges, the rate of oxidation increases tremendously, as is illustrated in these experiments.

Heukelekian (11) studied oxidation rates in activated sludge-sewage mixtures by determining the carbon dioxide produced. He confirmed Wooldridge and Standfast's observations that the oxidation rates in sewage-activated sludge mixtures were generally higher than occurred in the sewage and sludge separately. He also observed that in some cases a definite retardation of the oxidation rate took place when sludge and sewage were mixed. Activated sludge, however, showed a more rapid rate of oxidation than fresh solids even though the fresh solids contained a greater amount of oxidizable material. These experiments indicate again that when activated sludge with its established massive aerobic flora is aerated, high biochemical oxidation rates are obtained.

McNamee (12) determined the rates of oxidation in sludge alone and in mixtures of sludge plus sewage, using the same sludge in each case and carrying out the tests simultaneously. He assumed that the oxidation of the sludge at the same temperature and pH would be the same in each case and that the difference between the results obtained would represent the oxidation of the sewage by the activated sludge. From his studies with three sludges he concluded that the soluble and colloidal matter in sewage is oxidized much more rapidly than has been realized, and that a large part of the oxidation required for the stabilization of the oxidizable substances present in sewage occurs during the first few hours of contact with "good" activated sludge.

Butterfield (13) reviewed that portion of the literature of activated sludge which deals with the significance of the bacteria in this purification process and reports the isolation of a zooglea-forming bacterium from activated sludge. This zoogleal organism, in pure culture, in sterilized sewage under aeration produced a floc which simulated activated sludge. This pure culture floc was shown to bring about, during a 3-hour aeration interval, a 41 to 84 percent removal of the oxidizable material present in sewage. Such an extensive purification in such a short period suggests that this organism, or organisms of this type, are of very definite importance in this process. This purification was measured by determining the total amount of oxidizable material removed from the sewage without reference to the mode of its removal. It may have been adsorbed by the pure culture sludge, it may have been oxidized biochemically by the massed bacteria in the sludge, or both of these factors may have played a part in the purification process during the 3-hour aeration interval.

EXPERIMENTAL WORK—METHODS

Data will now be presented showing the portion of this total purification accomplished by pure culture sludges which can be attributed to biochemical oxidation.

1. *Isolation of bacterial cultures.*—In isolating cultures for this study, an effort was made to select organisms from good activated sludge which appeared to make up a marked and, in some cases, a major proportion of the bacterial content of the sludge. A number of cultures have been isolated from sludge produced in the station experimental plant and from activated sludges developed in regular plant installations in two other locations. The procedure followed in making the isolations was essentially the same as that previously used and described by one of us (Butterfield (13)). The fundamental characteristics of the bacteria thus isolated suggest that they all belong to the same general group of organisms as the zooglea-forming bacterium previously described. These cultures were isolated and propagated in synthetic media and in sterilized sewage. Ample precautions were taken in each instance to insure the purity of the cultures employed. Three different strains of zoogleal bacteria were used in these experiments. One of these strains was isolated from the station experimental plant, while the other two were obtained from two separate samples of activated sludge from the Lancaster, Pa., plant.

2. *Substrates.*—Sterile substrates were essential for the development of pure-culture sludges. Two kinds of substrate were employed: (*a*) Natural sewage sterilized by steam pressure in the autoclave, and (*b*) synthetic sewage, i. e., solutions simulating natural sewage.

(*a*) Natural sewage: Sterilization by heat was adopted as the most satisfactory procedure for obtaining a sterile natural sewage. While it is recognized that this procedure changes to some extent the natural condition of the sewage, experiments have shown that it altered the sewage less than other methods of sterilization which were available and that the sewage sterilized thus was adequately suitable for the development of good activated sludge. To determine definitely the difference which might exist between sludges developed on sterilized sewage and sludges developed on portions of the same sewage left in its natural state, the following-described experiments were carried out:

A mixture of good activated sludge and sewage was collected and 8 liters were placed in each of 2 aeration vessels, labelled A and B. Aeration was continuous at the same rate in both vessels except for 30-minute periods each day when the sludges were allowed to settle. At this period each day 5 liters of supernatant were withdrawn from each and in A this was replaced with 5 liters of fresh natural sewage while in B it was replaced with an equal amount of the same sewage which had been sterilized by heat and cooled prior to use. After this procedure had been carried on over a period of 48 days, through 41 such changes, the residual sludges were tested. These tests included suspended solids determinations, ash analyses and determinations of purification efficiency when the sludges were dosed with aliquot portions of the same natural sewage unsterilized. The purification efficiency was measured (by tests fully described later in this text), in each case after ½, 2, 4, and 24 hours' aeration by the total oxidizable material removed from the supernatant, by the amount of pollutional material oxidized biochemically, and by the amount of oxidizable material adsorbed by

the sludges. The agreement between the results obtained from the two sludges was excellent, in no instance differing by more than 5 percent.

This finding was considered a very definite indication that sewage sterilized by heat could be safely employed in our studies.

(*b*) *Synthetic sewage.*—The development of sludge in sewage under aeration has been universally observed. The source of this sludge has been to a great extent a matter of conjecture and theory. In sludge developed from normal sewage the source might readily be the solids present, altered somewhat by aeration and physical changes, or this sludge development might be aided by biological growth or by precipitation of dissolved and colloidal constituents of the sewage. To be able to observe accurately the influence of pure cultures of bacteria in sludge production and in the oxidation of pollutional material by such sludge, it was pertinent, in at least a few tests, that these bacteria be permitted to develop in solutions containing essentially the same dissolved constituents as sewage but which were entirely free from detritus and suspended substances of any description. Under such conditions, in a solution perfectly clear and free from all undissolved particles, sludge production should be readily observed and, if produced, could be definitely attributed to the activity of the bacteria present in pure culture. A stock solution of such characteristics was prepared and used in certain of our tests. The composition of this synthetic sewage was as follows:

Peptone, Difco, Bacto grade	gram	0. 3
Meat extract, Liebigs	do	0. 2
Urea, C. P. grade	do	0. 05
Disodium hydrogen phosphate, C. P	do	0. 05
Sodium chloride, C. P	do	0. 015
Potassium chloride, C. P	do	0. 007
Calcium chloride, C. P	do	0. 007
Magnesium sulphate, C. P	do	0. 005
Water, distilled	milliliters	1, 000

After sterilization this substrate was perfectly clear and had a hydrogen ion concentration of pH 7.3 to 7.4. The mineral salt content was approximately the same as that of sewage. The urea content was calculated to be about the same as that of domestic sewage, basing the calculation on Hawk and Bergeim's (14) data for the average amount of urea in urine excreted per capita per day and assuming the average daily pumpage of water per capita as the normal dilution. Sufficient amounts of peptone and meat extract were added to the solution to make its biochemical oxygen demand approximately the same as that of a strong domestic sewage. The pure cultures of bacteria being studied in these tests developed a well organized floc under aeration in this synthetic sewage in from 24 to 48 hours after inoculation. This floc would continue to accumulate under the conditions of the tests until a well-developed sludge was present. Micro-

scopic examination of these flocs revealed that they were composed principally, if not entirely, of closely packed masses of bacterial cells surrounded by a gelatinous matrix.

3. *Production of pure culture sludge.*—In developing the pure culture sludges for use in this series of experiments the procedure was the same with both sterilized natural sewage and synthetic sewage. Eight liters of sewage were placed in a 10-liter serum bottle which was equipped with a diffuser ball and inlet and outlet tubes for continuous aeration under aseptic conditions. The entire set-up was placed in the autoclave and sterilized under steam pressure. After this sewage had cooled and stood for at least 24 hours, tests for sterility and hydrogen-ion concentration were made. If the reaction was not between pH 6.8 and 7.4, it was adjusted with sterilized dilute phosphoric acid or sodium hydroxide. The sterile substrate was then inoculated with a pure culture, usually 1 ml of broth culture to the 8 liters, and aeration was started at once. As soon as a well-formed floc had developed, settling for 30 minutes was allowed and 5 liters of supernatant were siphoned off through a sterile siphon. The 5 liters withdrawn were replaced with the same amount of sterile sewage and aeration was resumed. This procedure of withdrawing the supernatant and adding fresh food was repeated once daily, except Sunday, until sufficient sludge had developed to provide material for the desired tests. This usually required from 10 days to 3 weeks. The pH of the supernatant was determined at each change, and the reaction of the sterile liquid added was so adjusted that the pH of the resultant mixture would be in the desired range of 6.8 to 7.4. The adjustment invariably required the addition of sterile dilute phosphoric acid, never alkaline solutions, as these cultures always produced an alkaline reaction.[1] Suspended solids determinations of the mixture were made from time to time to determine when sufficient sludge had developed for the tests.

4. *Preparation for experiment.*—After thoroughly mixing the 8 liters of pure-culture sludge developed as previously described, 1-liter portions were poured into each of two 1-liter cylinders. The sludge in the two cylinders and that remaining in the 10-liter bottle was allowed to settle for 30 minutes and the amount of supernatant that could be removed without disturbing the settled sludge was determined. This amount varied from 625 ml to 900 ml for the liter cylinders. For illustrative purposes, suppose that 800 ml could be removed; then this amount was siphoned from each of the liter cylinders and a proportionate amount, in this case 4,800 ml, was siphoned from the 6 liters remaining in the 10-liter bottle. Eight

[1] These cultures did not oxidize ammonia compounds to nitrites or nitrites to nitrates. It is reasonable to assume that if a balanced inoculation had been made, including the nitrifying bacteria, the byproducts of the combined oxidations would have tended to keep the reaction neutral. Additional experiments with the nitrifying bacteria in pure culture and in combination with the carbonaceous oxidizers are contemplated.

hundred and twenty-five ml of formula C (15) dilution water were added to one cylinder, 825 ml of the test feed (sterilized natural sewage or synthetic sewage) were added to the other, and 4,950 ml of the same feed were added to the 10-liter bottle. Immediately after mixing, 25 ml portions were removed from each cylinder and the large bottle for determination of the pH and suspended solids. The sludge mixtures in the cylinders were transferred to two special high-form 4-liter aeration bottles which were clamped to the closed system aeration apparatus.

Aeration was started simultaneously in the 10-liter bottle and samples of supernatant were removed for the determination of total purification at the same time intervals that the closed system aeration bottles were examined.

The analyses made for each experiment include:

(1) Dilution method B. O. D. determinations for periods of 2, 5, 7, 10, and, in the last four experiments, 15 and 20 days, were made on

(*A*) The old supernatant removed.

(*B*) The initial feed added.

(2) pH, suspended solids, and ash determinations on initial and after 24 hours' aeration samples of

(*C*) Sludge—dilution water mixtures in closed system aeration bottle (i. e., control for aeration method B. O. D.);

(*D*) Sludge—feed mixtures in closed system aeration bottle (i. e., sample for aeration method B. O. D.);

(E) Sludge—feed mixtures in 10-liter open-system aeration bottle (i. e., sample for total purification).

(3) The determination of the gaseous oxygen initially and after various periods, usually ½, 1½, 3, 5, 10, and 24 hours on (*C*) and (*D*).

(4) Dilution method B. O. D. for the same incubation periods as in (1) and after the same aeration periods as in (3) on the supernatant from (*E*).

As in this study we are dealing with pure-culture sludge fed with sterile sewage (natural or synthetic), all dilutions made up for B. O. D. determinations by the dilution method were seeded with stale settled sewage to insure a common inoculation and uniform results. The results obtained under (2) (*E*) and (4) dealing with the total purification accomplished are not presented or discussed in this paper, which is confined to biochemical oxidation alone.

5. *Apparatus and technique for aeration method B. O. D. determinations.*—The apparatus and technique developed by Theriault and Butterfield (16) for determining the B. O. D. by aeration in a closed system is ideally suited for our study. Figure 5, which shows an assembly of this apparatus, is presented in the appendix. The cam shaft D, driven by an electric motor, imparts a reciprocating motion to the plunger in the mercury U-tube. This alternately increases

and decreases the air pressure on the aeration line connecting one limb of the U-tube with the aeration bottle. On the upstroke the lower valve E acts as a seal, and air is drawn in through valve V. On the down stroke the ball valve V closes and bubbles of air are forced into the liquid. With a cam shaft speed of about 150 to 175 r. p. m. very satisfactory aeration can be maintained in the apparatus. Four duplicates of this apparatus were set up in a 20° C. constant-temperature room, and all the experiments in this paper have been carried out at that temperature. Details of the technique for the collection and analysis of the gas samples from this apparatus are given in the appendix.

EXPERIMENTAL DATA

The oxygen required for the oxidation of the control aeration mixtures in seven different experiments for various periods is shown in table 1. Table 2 shows the corresponding oxygen requirements for the feed aeration mixtures in the same experiments. The control and feed mixtures in each experiment were aerated simultaneously and examinations were made at the same time; the data are presented in separate tables simply for convenience. These tables contain in addition, corollary information regarding the cultures employed, the amount of pure culture sludge produced at the time of the test, the quantity of supernatant withdrawn and of fresh feed or dilution water added, the nature of the substrate feed added, and the 5-day biochemical oxygen demand, as determined by the excess oxygen dilution method, of the old supernatant and of the substrate feed added.

TABLE 1.—*Oxidation in Control Aeration Mixtures. Oxygen used when pure culture sludge suspension in synthetic or sterile sewage substrate is aerated but not fed*

x=Pure culture sludge. y=1-day old supernatant substrate. d=Formula C. dilution water.

Exp. no.	Culture	P. P. M. susp. solids=x	P. P. M. 5-day B. O. D. of y	Composition of aeration mix. (liters)	Mg O_2 used per liter in indicated time in hours					
					½	1½	3	5	10	24
1	Z-4	1,420	17.6	$x+.375y+.625d$	7.6	8.9	13.2	17.8		[3] 39.1
2	Z-4	1,632	16.2	$x+.375y+.625d$	6.1	6.9	11.3	18.7		[3] 52.1
3b	Z-1	773	13.8	$x+.09y+.91d$	7.7	[1] 10.1		[2] 15.9		23.2
3a	Z-1	843	13.8	$x+1.0y$	11.3	[1] 15.8		[2] 20.7		35.8
4	Z-9	2,644	14.5	$x+0.1y+.9d$	5.3	9.9	13.5	32.2	35.9	48.1
5	Z-9	1,560	15.0	$x+0.1y+.9d$	12.0	12.8	14.8	18.5	25.2	38.6
6	Z-9	2,428	10.6	$x+0.1y+.9d$	8.0	11.7	17.4	19.6	37.0	60.8
7	Z-9	1,632	11.4	$x+0.1y+.9d$	9.2	5.1	17.1	15.2	22.9	34.4

[1] 2 hours. [2] 4 hours. [3] 22 hours.

TABLE 2.—*Oxidation in Feed Aeration Mixtures. Oxygen used when pure culture sludge suspension in synthetic or sterile sewage substrate is fed immediately before experiment and aerated*

x=Pure culture sludge. y=1-day old supernatant substrate. z=Substrate feed added.

Exp. no.	Culture	P. P. M. susp. solids=x	P. P. M. 5-day B. O. D. of z	Substrate feed z	Composition of aeration mixture (liters)	Mg O_2 used per liter in indicated time in hours					
						½	1½	3	5	10	24
1	Z-4	1,420	287	Sterile sewage	$x+.375y+.625z$	32.4	56.4	77.0	93.1	------	[3] 151.0
2	Z-4	1,632	345	Synthetic sewage	$x+.375y+.625z$	37.1	86.2	118.2	139.7	------	[3] 210.4
3	Z-1	877	220	Sterile sewage	$x+.09y+.91z$	28.4	[1] 64.5	-----	[2] 91.4	------	182.4
4	Z-9	2,868	142	Sterile sewage	$x+0.1y+0.9z$	26.6	50.6	70.2	84.2	111.7	156.0
5	Z-9	1,728	170	Synthetic sewage	$x+0.1y+0.9z$	34.7	69.6	92.6	113.0	131.0	153.9
6	Z-9	2,544	170	Synthetic sewage	$x+0.1y+0.9z$	20.3	50.0	80.4	103.4	136.5	216.6
7	Z-9	1,632	142	Sterile sewage	$x+0.1y+0.9z$	29.6	46.0	63.4	79.6	97.7	138.3

[1] 2 hours. [2] 4 hours. [3] 22 hours.

DISCUSSION AND INTERPRETATION OF RESULTS

In these experiments the pure-culture sludge has been considered as of negligible volume and as merely suspended in the substrate liquor. It is appropriate to consider the sludge as entirely separate from the substrate liquor, because the pure-culture suspended sludge is largely organized living agent. The substrate liquor in these experiments includes old supernatant containing the pure culture suspended solids, the fresh feed liquor, and, in the controls, dilution water. For convenience in discussing these results,

let

x=the pure culture suspended solids in one liter of mixed supernatant liquor,
y=one liter of old supernatant substrate,
z=one liter of fresh feed liquor,
d=one liter of dilution water,
p=fraction of y remaining,
q=fraction of z or d used.

Then the experimental set-up for a control sludge aeration mixture and a fresh feed-sludge aeration mixture necessary for one experiment may be represented as follows:

Bottle A: Fed aeration mixture$=x+py+qz$.
Bottle B: Control aeration mixture$=x+py+qd$.

As $x+py$ are equal in each mixture and qd has no biochemical oxygen demand then for a given time interval the difference between the oxygen requirements of the fed aeration mixture and the control mixture, $A-B$, is produced by the increment of sterile sewage added, qz. While any increase in the oxygen requirement of the fed aeration mixture, A, can be attributed definitely to the addition of the feed, qz, it cannot be ascribed to the oxidation of the added feed alone without further consideration.

It is recognized that at any period of examination there are three sources from which the bacterial mass may draw material for oxida-

tion; (1) from organic material originally derived from the substrate but now held adsorbed in the floc; (2) from dead bacterial cells also held in the floc; and (3) from material dispersed in the substrate. In successive time intervals from this period of examination the material drawn from these respective sources will vary and the variation will increase as the time interval between observations is increased. Thus the amount drawn from (1) may affect the amount drawn for replacement from (3) and this will affect in turn the bacterial birth and death rate, or the amount of (2) available for oxidation at the next examination. Under the conditions of our experiments, however, for short time intervals the amount of organic matter drawn and oxidized from (1) and (2) is independent of the amount originally present in or drawn from (3) and depends upon the quantity and condition of the sludge x at the start.

The oxygen requirement of the component, $x+py$, of the mixture $x+py+qz$, (A), cannot be determined separately when it is in the mixture. Without such a determination three possibilities exist in regard to the oxygen requirements of the component, $x+py$, of the mixture A, in the presence of added feed, qz, as compared with its oxygen requirement in mixture B in the absence of qz; (1) That the oxygen requirement of $x+py$ is increased and its satisfaction is accelerated by the presence of qz in A; (2) That the oxygen requirement of $x+py$ is decreased and its satisfaction is retarded by the presence of qz in A; or (3) That the oxygen requirement of $x+py$ is the same in A as it is in B and is satisfied at the same rate in both mixtures.

In considering possibility (1) if the oxygen requirements of $x+py$ were higher in A than they were in B, then in accordance with known laws, it would follow that the quantity of x or $x+py$ would decrease. As a matter of fact in a long series of observations the quantity of x or $x+py$ has never decreased but has always increased. Hence there could be no increased oxidation of $x+py$.

With regard to possibility (2), such an effect if it actually occurred would tend to decrease the real differences between the oxygen requirements of A and B, or to decrease the indicated oxygen requirement of the added substrate, qz, which had been satisfied. Thus this assumption, if true, would act as a safety factor for any deductions which might be made regarding accelerated oxidation produced by the pure culture sludges.

Considered from another angle, in these tests with the exception of experiments 6 and 7 which will be discussed later, the pure culture sludges had been subjected daily to the same treatment which was given in the test. This is particularly true for experiments 4 and 5 where the added substrate, qz, a synthetic sewage, could be, and was, exactly reproduced from day to day. Accordingly it is reasonable

to presume that the residual $x+py$ at the end of any test period was substantially the same as the $x+py$ present at the start of such test.

Consequently, as possibility (1) cannot be true and (2) if true would tend to decrease the magnitude of the results and serve as a safety factor for any deductions made it appears logical and sound to assume in interpreting the results of these tests that the difference between the oxygen requirements of the fed aeration mixture and of the control aeration mixture, $A-B$, represents substantially for the given time intervals the biochemical oxygen demand of the added substrate, qz, as produced by the pure culture activated sludge under aeration.

Data, which have been obtained with natural activated sludge, to prove that $x+py$ is oxidized at the same rate in A as it is in B will be presented in a later paper on oxidation by natural activated sludge. Such data for pure culture sludges were not obtained as the large quantities of sludge necessary for such experiments are extremely difficult to produce and maintain under pure culture conditions.

This method [2] of determining the oxygen required for the oxidation of the added substrate by the sludge has been used throughout these experiments. In one experiment (No. 3) two different controls and a feed mixture were all aerated simultaneously. One control contained the sludge suspended in 0.09 liter of old supernatant liquor and 0.91 liter of dilution water. The second control contained the same quantity of sludge suspended in 1.0 liter of old supernatant liquor. Each control has been used separately with the feed-sludge aeration mixture. The results with one control have been designated as Experiment 3a and with the other as Experiment 3b. This designation for the experiment has been used throughout this paper. It will be shown that, using the method of calculation introduced here, the results for the oxidation of the total substrate in the feed-sludge aeration mixture check remarkably well when obtained with these two different control set-ups.

In table 3 the results showing the oxygen required to satisfy the B. O. D. of the added increment of substrate for each experiment are recorded. These results are obtained by deducting the values given in table 1 (oxygen required to oxidize the control aeration mixtures) from the corresponding values given in table 2 (oxygen required to oxidize the feed-aeration mixtures). It will be noticed that the values in table 3 for the oxidation of the added increment are considerably larger than the values in table 1 for the oxidation of the sludge suspension plus a portion of the old supernatant substrate. This great difference illustrates the tremendous importance of the B. O. D. of the substrate feed on the oxidation rates of sludge aeration

[2] This method is valid for determining the oxygen required to oxidize sewage only if the sludge control is a portion of the same sample used to treat the sewage, and if the absorption tests are carried out simultaneously as will be shown later.

mixtures. The significance of the effect of the substrate feed on oxidation rates is more readily observed by referring to figure 1, where the results for a typical experiment (No. 1) are graphically presented. These results also illustrate the marked efficiency of the pure culture sludge in the oxidation of sewage.

TABLE 3.—*Oxidation of Added Increment. Oxygen used to oxidize the increment of substrate added. (Mg O_2 used by feed culture minus mg O_2 used by the control)*

x=Pure culture sludge. y=1-day old supernatant substrate. z=Substrate feed.

Exp. no.	Feed mixture (liters) (1)	Control mixture (liters) (2)*	Added increment (1)—(2) (liters) (3)	5-day B. O. D. of added increment	Mg O_2 used in oxidizing added increment in indicated time in hours					
					½	1½	3	5	10	24
1	$x+.375y+.625z$	$x+.375y$	$.625z$	179.7	24.8	47.5	63.8	75.3	------	[3] 111.9
2	$x+.375y+.625z$	$x+.375y$	$.625z$	215.6	31.0	79.3	106.9	121.0	------	[3] 158.3
3a	$x+.09y+.91z$	$x+1.0y$	$-.91y+.91z$	169.5	17.1	[1] 48.7	------	[2] 70.7	------	146.7
3b	$x+.09y+.91z$	$x+.09y$	$.91z$	200.0	20.7	[1] 54.4	------	[2] 75.5	------	159.3
4	$x+.1y+.9z$	$x+.1y$	$.9z$	127.8	21.3	40.7	56.7	52.0	75.8	107.9
5	$x+.1y+.9z$	$x+.1y$	$.9z$	152.6	22.7	56.8	77.8	94.5	105.8	115.3
6	$x+.1y+.9z$	$x+.1y$	$.9z$	152.6	12.3	38.3	63.0	83.8	99.5	155.8
7	$x+.1y+.9z$	$x+.1y$	$.9z$	127.8	20.4	40.9	46.3	64.4	74.8	103.9

[1] 2 hours. [2] 4 hours. [3] 22 hours.

* The necessary quantities of dilution water that were added to make the controls up to one liter have been omitted from this column because they do not enter into the calculation.

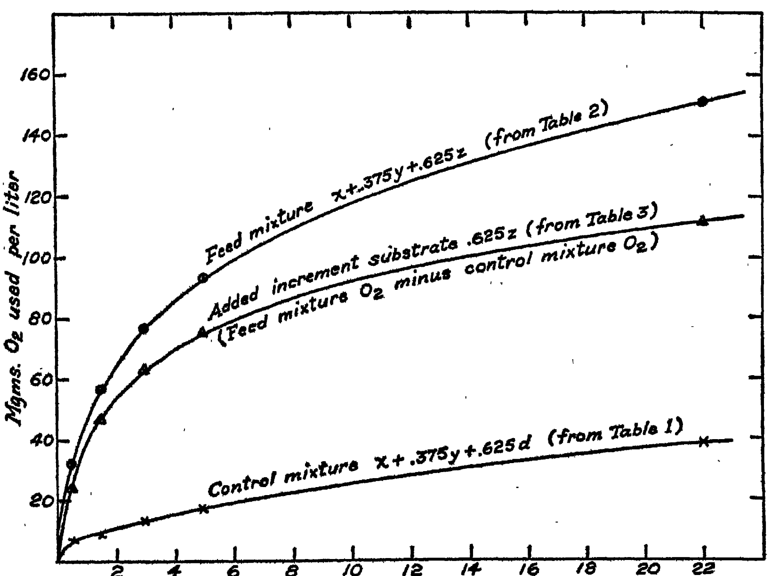

FIGURE 1.—Oxidation in pure-culture sludge-substrate aeration mixtures, Experiment 1.

From the data shown in table 3 the percentage of the 5-day B. O. D. of the added substrate oxidized by the pure culture sludge after various periods of aeration have been calculated and are pre-

sented in table 4. Typical oxidation curves expressed in these percentages during the 24-hour aeration period are shown in figure 2. An average of about 50 percent of the 5-day B. O. D. of the added substrate was oxidized during a 5-hour aeration interval. This rapid rate of oxidation is the more remarkable when one considers that it is carried on by bacteria in pure culture undoubtedly more restricted in their food habits than a grossly mixed culture would be. While definite information in regard to the food habits of these bacteria have not been obtained it is known that they do not oxidize nitrogen compounds to nitrites or nitrates.

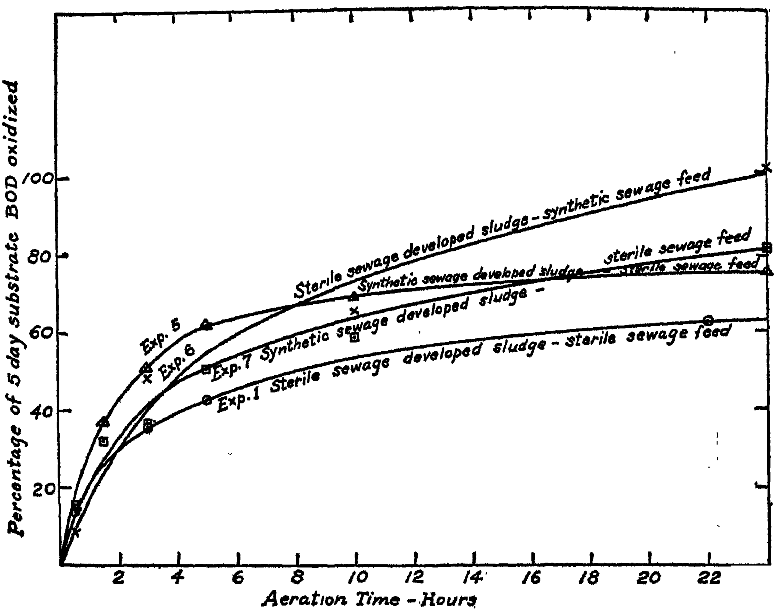

FIGURE 2.—Percentage of 5-day B. O. D. of total substrate oxidized.

As the B. O. D. of y was uniformly low in all of these mixtures it is a legitimate inference that most of the oxygen utilized by the mixture, $x+py$, was required to oxidize dispersate or solute condensed or absorbed on the sludge, x. While the fraction of y and its B. O D. was very low, corrections for the oxidation of the y component were estimated on the basis of the observed oxidations for the added substrate. These estimates varied from 0.1 to 1.1 p.p.m. after ½ hours aeration and from 1.0 to 4.5 p.p.m. after 24 hours for all experiments except 3a. In experiment 3a all of the y component was left in the control and the estimates in this case for the aeration periods given were 3.7 and 13.8 p.p.m. The application of these corrections provides for an estimation of the oxygen required to oxidize the sludge alone and of the oxygen required to oxidize the

mixed supernatant, $py+qz$. While these corrections may seem to be meticulous and so small as to be unnecessary they have been used.

TABLE 4.—*Percentage of the 5-day B. O. D. of the mixed supernatant substrate oxidized when aerated with pure culture sludge*

Exp. no.	Pure culture sludge developed on—	Substrate feed added for test	Percentage of 5-day B. O. D. oxidized in indicated time in hours					
			½	1½	3	5	10	24
1	Sterile sewage	Sterile sewage	13.8	26.6	35.7	42.1		[3] 62.5
2	do	Synthetic sewage	14.4	36.7	49.5	56.1		[3] 73.4
3a	do	Sterile sewage	9.2	[1] 26.1		[2] 37.8		79.0
3b	do	do	10.6	[1] 27.2		[2] 38.0		79.5
4	do	do	16.6	31.9	44.5	40.7	59.4	84.3
5	Synthetic sewage	Synthetic sewage	14.9	37.3	51.1	62.0	69.4	75.7
6	Sterile sewage	do	8.1	25.1	47.8	54.9	65.2	102.1
7	Synthetic sewage	Sterile sewage	16.0	32.0	36.2	50.5	58.7	81.4

[1] 2 hours. [2] 4 hours. [3] 22 hours.

TABLE 5.—*Milligrams of oxygen used to oxidize one liter of mixed supernatant substrate by pure culture sludge*

Exp. no.	B. O. D. of mixed supernatant substrate			MgO_2 used per liter in indicated time in hours					
	2-day	5-day	10-day	½	1½	3	5	10	24
1	109.3	185.9		25.7	49.3	66.2	78.1		[3] 116.0
2	174.3	221.7		31.9	81.5	109.9	124.4		[3] 162.8
3a	157.6	201.2	[4] 230.1	18.5	[1] 52.6	*64.5	[2] 76.5		158.8
3b	157.6	201.2	[4] 230.1	20.8	[1] 54.8	*65.4	[2] 76.0		160.4
4	90.0	129.3	135.3	21.5	41.3	57.6	52.6	76.8	100.0
5	113.0	154.1	205.7	22.9	57.5	78.7	95.5	107.0	116.6
6	112.9	153.7	205.4	12.4	38.6	63.5	84.4	100.2	156.9
7	89.8	128.9	135.3	20.6	41.3	46.7	65.1	75.6	104.9

[1] 2 hours. [2] 4 hours. [3] 22 hours. [4] 11 days.

*Estimated from 2- and 4-hour results.

Table 5 shows the oxygen used by pure culture sludge to oxidize 1 liter of mixed supernatant substrate. The values in table 5 differ from the corresponding values in table 3 by the small estimates for the oxidation of py. Figure 3 shows several typical substrate oxidation curves plotted from data in table 5. Here the marked efficiency of the pure culture sludges in the oxidation of pollutional material is again definitely apparent. Regardless of whether the sludge was developed on sterilized natural sewage or on synthetic sewage it was equally effective in oxidizing either synthetic sewage or sterilized natural sewage. The only difference noted was that the oxidation of the synthetic sewage appeared to be completed more rapidly. This, indeed, would be expected, for all of the oxidizable material in the synthetic sewage was in solution and readily available for bacterial oxidation.

It seems worth while to observe here that sludge was developed to the extent of 1,560 and 1,632 parts per million, respectively, in Experi-

ments 5 and 7, where synthetic sewage was employed. The development of this pure-culture activated sludge in a synthetic sewage containing all materials in true solution and free from suspended particles can be certainly attributed to the activity of the bacteria present in pure culture. Microscopic examinations of the individual flocs of this sludge showed that they were composed of closely packed masses of bacterial cells. The results obtained (tables 3, 4, and 5) show definitely that these sludges have the same oxidation efficiency as sludges developed in sterilized natural sewage.

To show the average performance of these pure-culture sludges in oxidizing the B. O. D. of the substrate, the mean number of milligrams

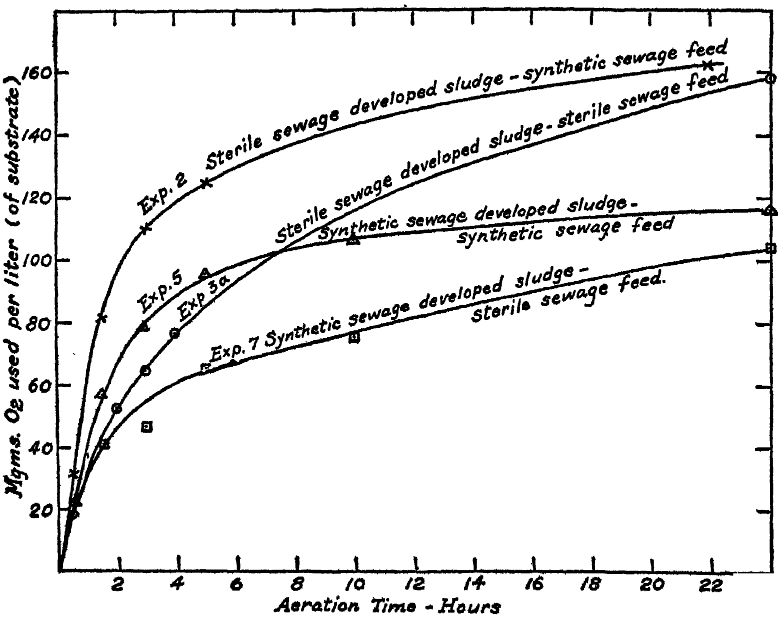

FIGURE 3.—Typical oxidation curves of supernatant substrate by pure-culture sludge.

of oxygen used for various units of aeration mixture have been calculated. The mean number of milligrams of oxygen, the standard deviation from the mean, and the percentage standard deviation for the results obtained at the ½-, 1½-, 3-, and 24-hour aeration periods are shown in table 6.

To determine the quantity of oxygen used to stabilize the pure culture sludge itself in these experiments, the milligrams of oxygen used to oxidize substrate as shown in table 5 are subtracted from the corresponding amounts of oxygen used in the entire feed aeration mixture as shown in table 2. The milligrams of oxygen used to oxidize sludge obtained in this way are shown in table 7.

TABLE 6.—*Mean milligrams oxygen used to oxdize substrate B. O. D. in all pure culture sludge experiments for various aeration mixture units*

Aeration time in hours	½			1½			3			24			Mean
	Mean mg O_2	S. D. ±	% S. D. ±	Mean mg O_2	S. D. ±	% S. D. ±	Mean mg O_2	S. D. ±	% S. D. ±	Mean mg O_2	S. D. ±	% S. D. ±	% S. D. ±
Per liter substrate {5-day B. O. D. 128.9 to 221.7}	21. 8	5. 26	24. 1	48. 7	13. 7	28. 2	70. 3	17. 8	25. 3	135. 7	24. 4	18. 0	23. 9
Per 100 p. p. m. 5-day B. O. D. per liter substrate	12. 9	3. 05	23. 6	28. 8	6. 4	22. 2	41. 1	7. 8	19. 0	79. 8	10. 5	13. 1	19. 5
Per gram suspended solids	15. 3	6. 50	42. 3	33. 6	13. 5	40. 2	48. 9	21. 1	43. 2	97. 7	55. 2	56. 6	45. 6
Per gram volatile suspended solids	20. 4	9. 23	45. 3	44. 9	18. 7	41. 7	65. 9	31. 0	47. 1	134. 4	79. 9	59. 6	48. 6
Per 100 p. p. m. 5-day substrate B. O. D. per gram suspended solids	8. 6	2. 98	34. 7	18. 9	5. 1	27. 0	27. 2	7. 7	28. 3	55. 1	23. 5	42. 7	33. 1
Per 100 p. p. m. 5-day substrate B. O. D. per gram volatile suspended solids	11. 0	3. 62	32. 9	25. 0	6. 5	26. 0	36. 5	11. 3	31. 0	74. 1	34. 3	46. 3	34. 1

S. D.=Standard deviation. % S. D.=Percentage standard deviation.

TABLE 7.—*Milligrams of oxygen used to oxidize the pure culture sludge suspension alone*

Exp. no.	P. P. M. sludge	Mg O_2 used to oxidize sludge in 1.0 liter of mixture in indicated time in hours						Mg O_2 used per gram of sludge in indicated time in hours						Mg O_2 used per gram of volatile solids in indicated time in hours					
		½	1½	3	5	10	24	½	1½	3	5	10	24	½	1½	3	5	10	24
1	1, 420	6. 7	7. 1	10. 8	15. 0	----	35. 0	4. 7	5. 0	7. 6	10. 6	----	[3]24. 6	6. 3	6. 6	10. 1	14. 0	----	[3]32. 6
2	1, 632	5. 2	4. 7	8. 3	15. 3	----	[3]47. 6	3. 2	2. 9	5. 1	9. 4	----	[3]29. 2	4. 2	3. 8	6. 7	12. 4	----	[3]38. 6
3a	843	9. 9	[1]11. 9	----	[2]14. 9	----	23. 6	11. 7	[1]14. 1	----	[2]17. 6	----	28. 0	16. 6	[1]20. 0	----	[2]25. 0	----	39. 6
3b	843	7. 6	[1]9. 7	----	[2]15. 4	----	22. 0	9. 0	[1]11. 5	----	[2]18. 2	----	26. 0	12. 7	[1]16. 3	----	[2]25. 8	----	37. 0
4	2, 868	5. 1	9. 3	12. 9	31. 6	34. 9	47. 0	1. 8	3. 2	4. 5	11. 0	12. 2	16. 4	2. 8	5. 2	7. 2	17. 5	19. 4	26. 2
5	1, 728	11. 8	12. 1	13. 9	17. 5	24. 0	37. 3	6. 8	7. 0	8. 0	10. 1	13. 9	21. 6	7. 4	7. 6	8. 8	11. 1	15. 2	23. 6
6	2, 544	7. 9	11. 4	16. 9	19. 0	36. 3	59. 7	3. 1	4. 5	6. 6	7. 5	14. 2	23. 4	4. 9	7. 1	10. 5	11. 9	22. 7	37. 4
7	1, 632	9. 0	4. 7	16. 7	14. 5	22. 2	33. 4	5. 5	2. 9	10. 2	8. 9	13. 6	20. 5	5. 8	3. 0	10. 8	9. 4	14. 3	21. 6

[1] 2 hours. [2] 4 hours. [3] 22 hours.

From the values in tables 7 and 2, the percentages that the oxygen used to oxidize sludge are of the total oxygen used in the feed aeration mixtures have been calculated. These percentages are shown in table 8 for all experiments. On the average, about 27.3 percent of the oxygen used in a freshly dosed pure-culture sludge during the first ½ hour of aeration is required to oxidize the sludge. This percentage drops to about 15 after 1½ hours of aeration and then apparently slowly rises, approaching the original figure after 24 hours.

TABLE 8.—*Percentage of the total oxygen used in fed pure culture sludge aeration mixtures that is required to oxidize the sludge alone*

Experiment no.	Percentage of total oxygen used to oxidize the sludge in indicated aeration time in hours					
	½	1½	3	5	10	24
1	20.6	12.6	14.0	15.0		[3] 23.2
2	14.0	5.5	7.0	11.0		[3] 22.6
3a	35.0	[1] 17.4		[2] 16.3		12.9
3b	26.7	[1] 15.0		[2] 16.9		12.0
4	19.1	18.4	17.9	37.7	31.2	30.2
5	34.0	17.4	19.2	15.4	18.3	24.2
6	38.8	22.8	21.0	18.4	26.6	27.5
7	30.0	10.2	20.0	18.2	22.8	24.1
Mean	27.3	14.9	16.5	18.6	24.7	22.1

[1] 2 hours. [2] 4 hours. [3] 22 hours.

The cause of this rather high percentage of oxygen (27) that is used to oxidize sludge during the first one-half hour is no doubt due to a degradation of the sludge during the preparation for the experiment while the sludge is settling and is not being aerated. A plausible explanation would seem to be that previous to the start of the experiment, the sludge has had no food material added for 24 hours, and during this time the easily available food material has become exhausted and a higher bacterial death rate has apparently set in, thus providing an increased proportion of food for the bacteria remaining, which is a contributory cause of the high oxygen consumption of the sludge during this period. During the next 2 to 4 hours, the sludge bacteria reach their maximum rates of oxidation and are apparently also reproducing at their maximum rate. The smallest portion of the total oxygen is used to oxidize the pure culture sludge during this period, and the percentage so used falls to about 15. After 4 or 5 hours the most easily available food supply is exhausted, and the rate of reproduction of the organisms falls while the death rate with the consequent increase in degradation products slowly rises. This results in a very slow increase in the percentage of oxygen that is being used to stabilize the sludge itself during the remainder of the 24-hour aeration period.

Table 9 shows the percentages of the total oxygen used in pure-culture sludge aeration mixtures that are required to oxidize the sludge for substrates of varying initial B. O. D. It will be noticed that the percentage of oxygen used to oxidize the sludge alone in an aeration mixture varies inversely with the B. O. D. of the substrate. When a pure culture aeration mixture having a B. O. D. of the substrate of 6 to 14 parts per million in 5 days was aerated about 86.9 to 83.4 percent of the oxygen used was required to oxidize the sludge during the first half hour. When the supernatant of such a mixture was withdrawn and a feed material was added until the 5-day B. O. D.

of the substrate was 172, the oxidation rate in the aeration mixture increased and the percentage of oxygen used to oxidize sludge fell to about 27.3 percent of the total used. This illustrates that the percentage of oxygen used by the pure culture sludge in a sludge-aeration mixture varies considerably depending apparently upon the condition of the sludge itself and the B. O. D. of the substrate.

TABLE 9.—*Percentage of total oxygen used in pure-culture sludge aeration mixtures that is required to oxidize sludge*

	No. of experiments	Mean substrate B. O. D., 5 days	Percentage of the total oxygen used to oxidize the sludge in indicated time in hours					
			½	1½	3	5	10	24
Feed-sludge mixtures	8	172.0	27.3	14.9	16.5	18.6	24.7	22.1
Sludge-old supernatant ($x+1y$)	1	13.8	83.4	75.3	------	74.4	------	66.0
Sludge-old supernatant ($x+.375y+.625d$)	2	6.35	86.9	74.0	81.1	83.2	------	90.4
Sludge-old supernatant ($x+.1y+.9d$)	4	1.28	97.8	94.5	95.3	96.0	96.6	96.8

The composite oxidation results for all experiments with pure-culture sludge have been calculated and are shown in table 10. These results are plotted in figure 4. The lower curve in this figure represents the average oxidation of the pure culture sludge alone. The intermediate curve shows the average oxidation of the substrate alone by the pure-culture sludge. The upper curve represents the total oxidation in the fed aeration mixtures, and each point on it includes the sum of corresponding points of the other two curves. The total oxidation curve for all substrate–sludge aeration mixtures can be separated into two components, one representing the oxidation of the sludge and the other the oxidation of the substrate. In this composite curve the oxidation of the sludge varies between 27 and 15 percent of the total oxidation. As the B. O. D. of the substrate falls, the substrate oxidation curve also falls and the oxidation of the sludge represents a larger proportion of the total oxidation, as has already been shown in table 9.

TABLE 10.—*Composite oxidation results for all experiments*

	Mg O_2 used per liter of fed-sludge aeration mixture in indicated time in hours				
	½	1½	3	5	24
Oxidation of pure-culture sludge	7.9	8.5	13.2	21.5	38.2
Oxidation of supernatant substrate	21.8	48.7	70.3	83.3	135.7
Total oxidation of aeration mixture	29.7	57.2	83.5	104.8	173.9

The expression, $y=L-[a(10^{-K_1t})+b(10^{-K_2t})]$, suggested by Theriault and McNamee (6), was graphically fitted to the substrate oxidation results shown in table 5. In this equation the constants a and b correspond to the L_1 and L_2 portions of the total demand. In fitting this expression to these results, the total first-stage demands (L values) were estimated from the 5-, 10-, and 20-day dilution method B. O. D. of the substrates, corrected for oxygen used to form nitrites and nitrates. The constants thus obtained are shown in table 11. The observed values (table 5) fitted the derived curves reasonably well and the constants indicate in all cases a very high rate biochemical oxidation by these pure-culture sludges. It will be noted that there is

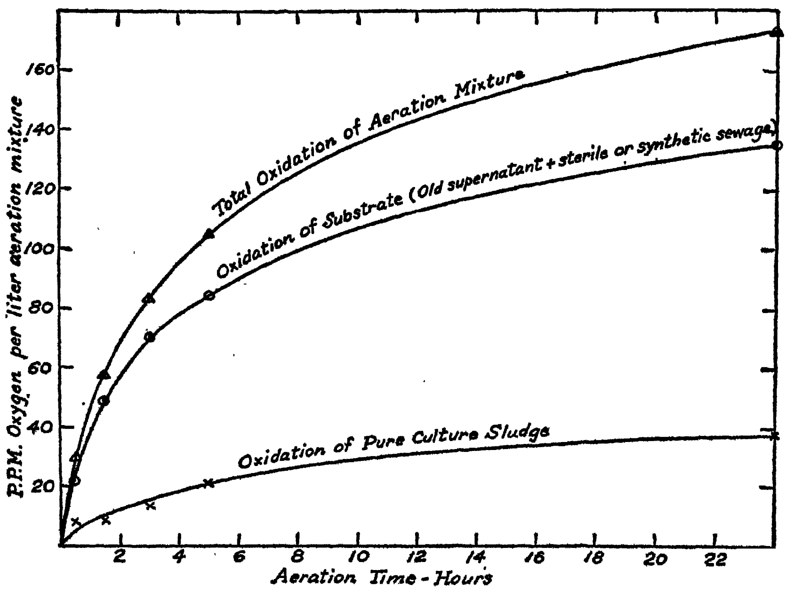

FIGURE 4.—Mean oxidation curve for all pure-culture sludge experiments.

considerable variation in the constants obtained from the several experiments, i. e., K_1 (the velocity constant for the rapid oxidation representing about 25 percent of the total carbonaceous demand) varies from 68 to 126 times the single velocity constant ordinarily accepted as representative of normal biochemical oxidation as observed in diluted samples or in streams. This variation probably was to be expected, as (1) these sludges were developed using three different strains of bacteria, each in pure culture; (2) five sludges were developed on sterilized natural sewage and two were developed on synthetic sewage; and (3) the feed was varied so that sludge developed on natural sewage was tested with synthetic sewage feed and sludge developed on synthetic sewage was tested with natural sewage feed.

TABLE 11.—*Constants for curves for substrate oxidation by pure culture sludge*

Constants to fit the expression $Y = L - [a(10^{-K_1 t}) + b(10^{-K_2 t})]$

Exp. no.	L, estimated total carbonaceous demand	a	b	t expressed in hours		t expressed in days	
				K_1	K_2	K_1	K_2
1	[1] 274	65	209	.313	.0057	7.51	.136
2	[1] 326	109	217	.357	.0054	8.57	.129
3a	[2] 273	45	228	.377	.0122	9.05	.293
3b	[2] 273	46	227	.416	.0126	9.98	.302
4	[3] 176.5	41.5	135	.526	.0126	12.6	.302
5	[3] 217.8	74.8	143	.427	.0070	10.2	.168
6	[3] 216.0	51	161	.286	.0150	6.86	.360
7	[3] 179.7	51.7	128	.377	.0095	9.05	.227

[1] Estimated from 5-day B. O. D. values.
[2] Estimated from 5- and 10-day B. O. D. values.
[3] Estimated from 5-, 7-, 10-, 15-, 20-, and 35-day B. O. D. values corrected for NO_2 and NO_3 formed.

SUMMARY AND CONCLUSIONS

The literature dealing with the biochemical oxidation of sewage by activated sludge is reviewed briefly.

Various bacteria which make up a major portion of the bacterial flora of activated sludge have been isolated in pure culture. Employing these bacteria in pure culture, activated sludge has been produced in sterilized natural sewage and in sterile synthetic sewage. This production of activated sludge in synthetic sewage (which was entirely free from detritus and suspended substance) by pure cultures of bacteria is definite evidence that these bacteria, at least under the conditions of test, are responsible for the production of activated sludge. Using a procedure which has been developed for the determination of the rate of biochemical oxidation of activated sludge mixtures it was found that the addition of fresh nutrient substrate to these pure culture activated sludges under aeration very greatly increased the quantities of oxygen utilized. The increase observed when the oxygen requirements of fed mixtures and control mixtures are compared has been attributed to the oxidation of the added substrate.

The results show that about 50 percent of the 5-day B. O. D. of a sewage is oxidized by 5 hours' aeration with these pure-culture sludges and that about 80 percent of the 5-day B. O. D. is oxidized in 24 hours. Nitrogenous materials are not included in this oxidation as these bacteria are not capable of such action. With freshly dosed sludge the oxygen required for the oxidation of the sludge alone represented from 15 to 27 percent of the total.

The expression suggested by Theriault and McNamee was fitted to the data for the first stage, or carbonaceous oxidation of the substrate, obtained when sewage was aerated with these pure-culture sludges. The results indicate that, during the first 3 to 5 hours of

aeration, the velocity constant of the oxidation rate is 68 to 126 times greater than the established constant for normal biochemical oxidation in diluted samples or in streams. This rapid rate of oxidation "breaks" after 3 to 5 hours of aeration, but the velocity constant for the remainder of the 24-hour period is still considerably greater than the established constant.

It may be concluded from the results of these tests with sludges developed by bacteria in pure culture that reactions of the same general type are indicated in each test and that the velocity constants are all much greater than the constant for normal biochemical oxidation.

While it is desired to emphasize the primary importance of bacteria in the activated sludge process of sewage purification, it is not desired to create the impression that these bacteria, whose activities are reported, are the only ones which can promote rapid oxidation under such conditions. No doubt there is a considerable group of organisms capable of such action. The primary prerequisite for this type of organism, in addition to oxidizing capacity, appears to be the ability to grow in a liquid medium in a massed floc or colony which binds itself together tenaciously enough to remain intact under the agitation of the aeration required to maintain aerobic conditions.

ACKNOWLEDGMENTS

It is desired to express our sincere appreciation to the members of the staff of the Stream Pollution Investigations Station of the United States Public Health Service for their assistance in preparing the drawings for the figures, in critically reviewing the paper, and especially to Assistant Bacteriologist Elsie Wattie for assistance in the analytical work and in the preparation of pure-culture sludges.

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Appendix

TECHNIQUE FOR THE AERATION METHOD B. O. D. DETERMINATION

Before aerating the sludge mixtures, samples of gas from each closed aeration bottle are taken. Oxygen U-tube absorption vessels are required for each test. The stopcock A of the absorption vessel (see fig. 5) is turned to connect with the 2-ml cup; and with the stopper removed, distilled water of known oxygen content is siphoned into the right-hand limb of the U-tube. The delivery tube of the siphon is kept near the bottom of the U-tube, and water is added to fill the capillary bore leading to the 2-ml cup. The stopcock is then turned to communicate with the capillary tube alongside the cup.

The procedure used to obtain a sample of gas consists of the following steps: (1) Connect the water-jacketed gas burette with the aeration bottle; (2) the U-tube absorption vessel, filled with distilled water of known oxygen content, is connected to the gas burette; (3) the air in the capillary tube connecting the U-tube and gas burette is replaced by water drawn from the U-tube by lowering the mercury level of the burette; (4) the air and excess water are expelled from the apparatus, after turning the stopcock B 180°, by raising the mercury level of the burette; (5) the mercury level is allowed to rise above stopcock C and held in this position by closing the stopcock at the base of the burette; (6) the stopcock C is now turned 45° and the mercury allowed to flow back into the reservoir by opening the stopcock at the base of the burette; (7) the mercury level is now adjusted so that it is at the 10.000-ml graduation on the stem of the burette (the stopcock at the base of the burette is used to control this manipulation); (8) the 10-ml sample of gas is transferred to the U-tube absorption vessel by turning stopcock B 180° and raising the mercury reservoir, after opening the stopcock at the base of the burette; (9) close stopcock A after all the gas and a little mercury have entered the

U-tube; (10) close stopcock C; (11) disconnect U-tube from burette, insert glass stopper, invert and allow the mercury to flow from U-tube by opening stopcock A; (12) close stopcock A and return U-tube to an upright position in such a manner that all the gas will be on the stopcock side of the U-tube.

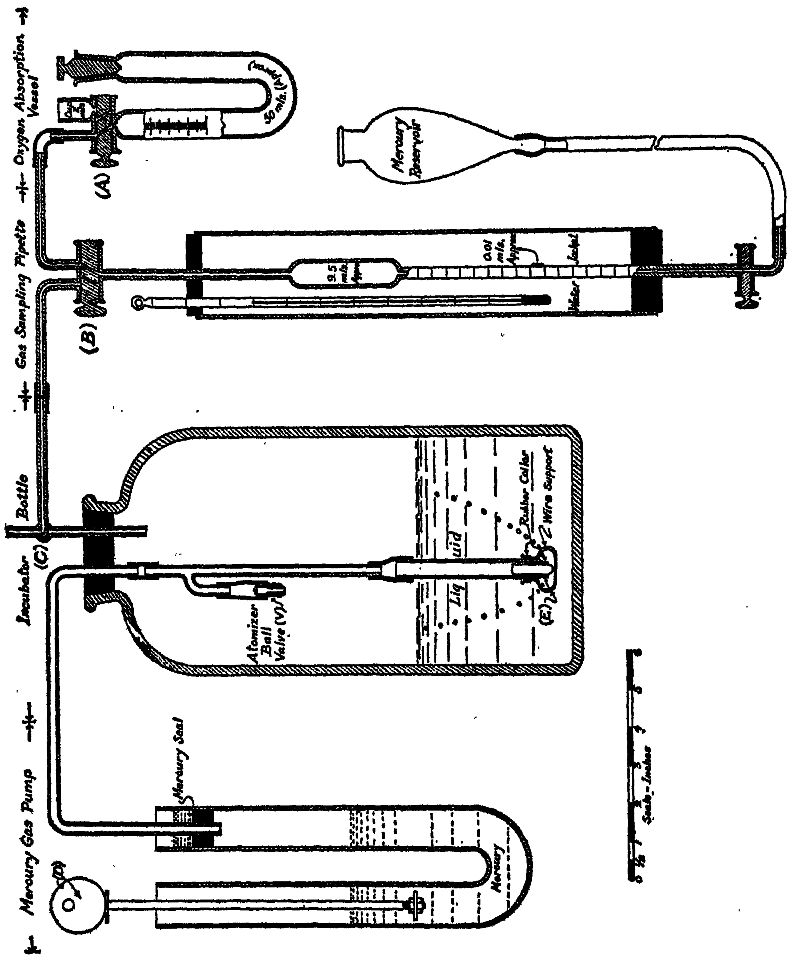

FIGURE 5.—Apparatus for determining B. O. D. by the aeration method in a closed system.

With stopcock A closed, and with the gas in the closed limb of the U-tube, 1 ml of each of the usual Winkler reagents is added through the open limb. The reagent pipettes are inserted to the bottom of the U-tube, and care must be taken not to deliver any reagent in the upper part of the tube. Pipettes which terminate in tubes of small bore should be used and, after being filled with reagent, should have their outsides flushed with running water. When the reagents have been added, the stopper is replaced and the U-tube is agitated

mechanically for 10 minutes. A shaker with a special head to accommodate four oxygen absorption U-tubes has proved very satisfactory for this purpose in our laboratory. With this shaker it was found that all of the oxygen could be transferred from the gas to the liquor well within the 10-minute period, so that this period of agitation always insured the completion of this reaction.

After the proper agitation, the acid (1 ml of conc. H_2SO_4, sp. gr. 1.84) is added to the 2-ml cup and allowed to run into the U-tube. After this is shaken to dissolve the precipitate, the liberated iodine is titrated with 0.025 M sodium thiosulphate (1 ml of 0.025 M thiosulphate corresponds to 0.2 mg of O_2).

To correct for the volume of oxygenated distilled water added to the absorption vessel it is convenient to calibrate each U-tube with reference to graduated markings as shown in figure 5. Then, before acidification, the volume of water used may be read off directly. The 2 ml of reagents used are deducted from the total volume of liquid, on the assumption that the Winkler reagents contain no dissolved oxygen.

After each period of aeration, the aeration machine is stopped, the gas volume on the aeration limb of the mercury pump U-tube is read, and the gas is sampled and analyzed as described. All readings may be recorded on a convenient form such as shown in table 12.

TABLE 12.—*Computation—Aeration method for oxygen demand of activated sludge mixtures*

Date: *5-19-36*. Nature of sample: *Pure culture sludge+sterile sewage*. Series: *1*.
Total volume aeration bottle=T= 4,058 ml.
Settled sludge volume 375 ml.
Dilution water or feed volume added 675 ml.
Total volume aeration mixture 1,000 ml.

Time of sampling	t	t_1	t_2	t_3	etc.
Period of aeration, elapsed time in hours	0.	0.5	1.5		
Volume of expanded gas=V ml					
V_1=Initial volume of gas in bottle=$T-1000$	3,058	3,058	3,058		
t =Volume of gas to mercury level on sample bottle limb of mercury U-tube	50	47	46		
V_t=Total initial volume of gas=$T-1000+t$	3,108	3,105	3,104		
v =Expanded sample of gas=10 ml					
V =Total volume expanded gas=V_t+10*		3,115	3,114		
Dissolved oxygen in water used in U-tube (ml titrated=200)					
Readings with .025 M sodium thiosulphate R	16.14				
Readings with .025 M sodium thiosulphate R_1	7.32				
A=mg per liter	8.82	8.82	8.82		
Gaseous oxygen—milligrams per ml of gas (=r)					
B =ml of H_2O used in U-tube	30.2	30.2	30.2		
v =ml of gas sampled=10 ml					
Readings with .025 M sodium thiosulphate R	44.70	35.70	37.48		
Readings with .025 M sodium thiosulphate R_1	30.45	22.00	24.20		
D =Ml N/40 Thio. used=$R-R_1$	14.25	13.70	13.28		
f =Factor for mg O_2 per ml	.2				
fD=Mg O_2 in U-tube	2.850	2.740	2.656		
E =Mg O_2 in H_2O in U-tube=$AB/1000$	.266	.266	.266		
F =Mg O_2 in 10 ml gas=$fD-E$	2.584	2.474	2.390		
r =Mg O_2 per ml of gas=F/V=$F/10$	.2584	.2474	.2390		

Gaseous oxygen before sampling (i. e., including the sample), mg per liter of liquid					
$r.V=g$		770.7	744.2	*	
Gaseous oxygen after sampling (i. e., excluding the sample), mg per liter of liquid					
$r.V_t=g^1$	803.1	768.2	741.9		
Initial oxygen content, total mg per liter liquid $=O^1$					
$O^1=g^1$		803.1	768.2		
Final oxygen content, total mg per liter of liquid $=O$					
$O=g$		770.7	744.2		
Oxygen demand over given period $=(Z$ mg per liter, t to $t_1)$ etc.					
$Z=O_1-O$		32.4	24.0		
Oxygen demand—for cumulative period $=Y=\Sigma Z=$ mg per liter, total					
$Y=\Sigma Z$		32.4	56.4		

* Very small volume of gas expanded in capillaries is considered negligible.

Table 12 has been arranged to be self-explanatory and to illustrate the complete method of calculation of the oxygen consumption in milligrams per liter for the periods for which samples are collected. As 1 liter quantities of liquid mixtures are used, the figures obtained represent directly parts per million of oxygen used for the periods covered.

OVERSEAS TRANSMISSION OF BUBONIC PLAGUE

A Danger Almost Eliminated

The Public Health Service believes that the problem of overseas transmission of bubonic plague is almost solved. This announcement means little to the generation that is unfamiliar with the excitement and potential danger that accompanied the occurrence of this dread disease in San Francisco, Seattle, and New Orleans in the early part of the present century. However, to the commercial interests, to the cities that have been called upon to pay handsome tributes in cash for rat-proofing, and to the public health interests that have engaged in expensive and prolonged battles against this disease, this statement is received with deep satisfaction.

The interest of the United States in this favorable development lies in the fact that bubonic plague may be introduced through the medium of infected rats brought to American ports by ships. While it may not be without the realm of possibility that, under favorable meteorological conditions, fleas without a host can serve as reservoirs of plague infection, carry it over long distances, and later, under

favorable conditions, transmit the disease, such danger is probably insignificant in comparison with the danger from infected fleas carried by rats. When an infected rat escapes and, through the transfer of fleas, infects other rats, the scene for a widespread dissemination of the disease is speedily set. Rats are great travellers; and they are such close neighbors of man, especially in congested and insanitary sections of cities, that fleas may easily find human victims. It is possible, of course, to suppress such an epidemic with a liberal expenditure of money and expert human effort; but the preferable way to deal with the problem is to scotch it before it can get under way.

The announcement of the Public Health Service regarding the solution of this problem of maritime transmission of bubonic plague from one country or locality to another is based upon a study of 4,418 ship entries at Atlantic ports between July 1, 1936, and January 31, 1937, a period of 7 months. This survey disclosed that 8.4 percent of these entries were ships infested with rats, while the remainder were free from such potential danger. These figures, compared with the 50 percent of ships found to be rat infested by means of a rat-flea survey of ships in the port of New York between 1925 and 1927, indicate a tremendous decline of rat infestation during the past 10 years. This marked reduction is believed by quarantine officials to be due very largely to the intensive efforts exerted by the quarantine officials of most countries in cooperation with shipowners and operators to maintain ships free from rodents. The specific factors responsible for this satisfactory condition are effective fumigation, rat-proofing of vessels, international certification, and intensive rat-infestation inspection.

The development of rat-infestation inspection has made it possible to make valuable concessions regarding quarantine and expensive delays to ships' operators in return for maintaining rat-free vessels. These concessions have been safe-guarded by international certification. Rat-proofing of ships has provided an effective method of preventing the establishment and maintenance of rat colonies on shipboard, while improved methods of fumigation have exterminated those rats which escape other combative measures.

The marked reduction in the rat population on ships may be recorded as an achievement in cooperative effort in which public officials and private interests have played an equally fine part. That the menace of bubonic plague has practically been removed from ship transportation is a matter of importance to the public health officials who must fight such a foe and to the national and local governments which must appropriate large sums of public money for rat-proofing and supporting the task of rat extermination.

However, with the advantage that has been gained it would manifestly be foolhardy to relax the precautions that have brought about

the decrease of rat populations on ships. Quite on the contrary, there is need for the continuation and even intensification of the methods that have brought about the favorable conditions, not only to maintain these excellent conditions, but to make even further advance in the fight against the rat as a carrier of disease in maritime commerce.

MOSQUITOES ON AIRPLANES

The quick passage of airplanes from South American countries to the United States and the specific possibility that mosquitoes infected with yellow fever may be transported in such carriers make it necessary for quarantine officers in domestic ports to keep a sharp lookout for dangerous insect visitors. That insects are conveyed in airplanes is now recognized as an actuality and a source of potential danger.

During November 1936, for instance, 69 inspections were made by officers of the Public Health Service at Miami, Fla., of airplanes arriving from South American ports. These inspections were made to determine the presence of mosquitoes transported from the South American Continent. In 45 instances no insects were found. However, during the course of 24 other inspections 53 insects were captured while 1 escaped. In 7 of the 24 inspections 13 mosquitoes were found, 10 being dead. The maximum number of mosquitoes found during a single inspection was 3, of which number 2 were dead.

The 13 mosquitoes found during the seven inspections were identified as follows:

Aëdes sollicitans	1
Culex, species unidentified	1
Culex quinquefasciatus	3
Culex inhibitator	1
Mansonia indubitans	1
Mansonia titillans	3
Unidentified	3

While no yellow-fever mosquitoes were discovered on the inspections here reported, the list shows that such mosquitoes might easily be brought into this country by airplanes unless adequate measures are observed to prevent their importation.

MORTALITY IN KENTUCKY ATTRIBUTED TO THE FLOOD

The Director of the Bureau of Vital Statistics of the Kentucky State Health Department, Mr. J. F. Blackerby, has recently compiled a tabulation showing the number of deaths from certain causes in 54 counties and 10 cities of the State resulting directly and indirectly from the flood. The figures, which cover the flood period, January 22 to February 28, 1937, are as follows: Pneumonia, 252 (of which 139

were in Louisville); influenza, 54; drowning (in flood waters), 16; explosion, 15; exposure, 10; accident (other than drowning and explosion), 9; heart disease, 7; total 363.

The significance of these figures is found in their small numbers and in the fact that they show no epidemic outbreak. The average numbers of deaths from pneumonia in Kentucky for January and February for the three years 1933–35, inclusive, were 312 and 326 respectively, and the average numbers of total deaths for these months for 1933 and 1934 were 2,774 and 2,547. It is clearly apparent that, during the stress and excitement in the midst of the disaster, the extent of the death toll, especially as reported in the press, was greatly overestimated.

In view of the relative suddenness with which the flood swept upon Louisville, the large population affected, especially in that city, the abrupt disruption of normal conditions of life, the lack of heating facilities, the hazard to health incident to exposure and to the dangers involved in the limitations of water supplies and sewage disposal, and the general confusion resulting from the mass movement of a considerable part of the population, the relatively small numbers of deaths attributed to flood conditions is remarkable. For these favorable health conditions and the absence of any epidemic outbreaks in the presence of such a catastrophe, a large share of the credit is due to the prompt and efficient efforts of health officers and sanitary engineers in the application of the principles of modern sanitary knowledge, as well as to the efforts of other agencies, official and unofficial, which responded with such promptness in giving aid in the work of rescue and in the care of those dispossessed of their homes and otherwise affected by the flood.

Available information appears to indicate that equally noteworthy results in the control of preventable diseases were also recorded in all of the other States included in the flood area.

DEATHS DURING WEEK ENDED MARCH 13, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 13, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9,557	10,082
Average for 3 prior years	9,554	
Total deaths, first 10 weeks of year	104,715	98,346
Deaths under 1 year of age	606	605
Average for 3 prior years	651	
Deaths under 1 year of age, first 10 weeks of year	6,407	5,782
Data from industrial insurance companies:		
Policies in force	69,403,932	68,130,517
Number of death claims	15,595	15,158
Death claims per 1,000 policies in force, annual rate	11.7	11.6
Death claims per 1,000 policies, first 10 weeks of year, annual rate	11.6	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 20, 1937, and Mar. 21, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936
New England States:								
Maine	2	2	113	16	28	75	2	0
New Hampshire					50	2	0	0
Vermont		1			1	794	0	0
Massachusetts	5	5			864	888	4	12
Rhode Island	1				482	31	1	2
Connecticut	5	8	18	48	658	85	0	1
Middle Atlantic States:								
New York	56	38	[1] 47	[1] 40	703	2,739	14	31
New Jersey	14	10	19	64	2,987	193	4	5
Pennsylvania	34	26			322	952	13	6
East North Central States:								
Ohio	24	21	48	13	252	264	11	13
Indiana	12	11	85	49	60	8	3	5
Illinois	45	33	77	47	70	50	8	18
Michigan	13	7	3	7	62	88	3	4
Wisconsin		2	67	75	23	104	2	3
West North Central States:								
Minnesota	5	2	2		24	349	0	2
Iowa	3	18	6	12	8	4	1	5
Missouri	15	83	253	1,040	18	26	2	4
North Dakota	2	1	4	5	1	5	0	0
South Dakota					2	2	0	1
Nebraska	2	9	4		5	85	0	1
Kansas	9	13	40	121	13		2	1
South Atlantic States:								
Delaware			9	2	48	8	0	2
Maryland [2]	8	7	45	27	877	175	4	21
District of Columbia	3	13	2	4	59	37	3	4
Virginia	24	14		1,331	120	257	15	11
West Virginia	9	13	229	173	20	20	12	5
North Carolina [2]	9	9	248	351	167	71	1	7
South Carolina	5	2	1,508	689	41	36	5	7
Georgia [2]	5	11	779	788			2	7
Florida [2]	8	5	14	47	5	4	14	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 20, 1937, and Mar. 21, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936
East South Central States:								
Kentucky	12	8	119	190	110	122	12	48
Tennessee	12	8	522	569	34	106	13	20
Alabama [3]	8	8	1,874	2,216	14	23	19	5
Mississippi [2]	4	4					1	0
West South Central States:								
Arkansas		8	211	607		4	0	6
Louisiana	18	15	88	385	21	84	20	2
Oklahoma [4]	10	7	287	305	12	15	5	5
Texas [3]	29	38	1,677	558	476	392	8	10
Mountain States:								
Montana	1		25	7	18	13	0	0
Idaho		1	4	9	13	10	0	2
Wyoming		1			1	6	0	0
Colorado	8	4			4	13	1	0
New Mexico	1	6	33		110	29	1	2
Arizona	2	2	30	298	195	37	0	0
Utah [3]	1	2			23	17	0	0
Pacific States:								
Washington	1	2		35	39	278	2	3
Oregon [5]		4	51	134	10	399	2	2
California	25	30	311	1,187	206	1,985	5	8
Total	450	507	8,852	11,449	9,246	10,885	215	297
First 11 weeks of year	5,956	6,809	244,532	85,813	61,922	88,643	1,843	2,510

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936
New England States:								
Maine	0	0	26	6	0	0	0	0
New Hampshire	0	0	21	2	0	0	0	0
Vermont	0	0	8	20	0	0	0	0
Massachusetts	0	0	287	280	0	0	4	1
Rhode Island	0	0	67	29	0	0	0	1
Connecticut	0	0	167	116	0	0	0	1
Middle Atlantic States:								
New York	1	1	1,052	1,153	4	0	4	8
New Jersey	0	0	239	640	0	0	1	0
Pennsylvania	0	1	785	522	0	0	1	7
East North Central States:								
Ohio	4	0	308	367	1	1	6	45
Indiana	1	0	264	337	5	5	0	1
Illinois	2	2	874	1,067	21	19	10	1
Michigan	0	0	828	326	0	2	4	0
Wisconsin	0	2	407	669	7	11	6	1
West North Central States:								
Minnesota	0	0	160	387	9	0	0	0
Iowa	0	1	322	283	25	27	0	4
Missouri	0	0	456	247	76	10	3	3
North Dakota	0	1	30	47	17	4	0	0
South Dakota	0	0	48	58	0	14	0	0
Nebraska	0	2	106	209	11	51	0	0
Kansas	0	0	442	378	59	74	1	0
South Atlantic States:								
Delaware	0	0	6	4	0	0	0	0
Maryland [2]	0	1	47	92	0	0	2	2
District of Columbia	0	0	17	19	0	0	1	1
Virginia	1	0	17	59	0	0	3	1
West Virginia	0	0	39	52	0	0	11	7
North Carolina [3]	1	0	40	27	1	1	1	1
South Carolina	0	0	6	1	1	2	4	2
Georgia [3]	1	0	22	27	0	0	2	2
Florida [3]	0	0	10	6	0	0	3	0

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 20, 1937, and Mar. 21, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936	Week ended Mar. 20, 1937	Week ended Mar. 21, 1936
East South Central States:								
Kentucky	0	2	46	42	0	0	6	2
Tennessee	1	0	24	47	0	0	1	8
Alabama [3]	0	0	10	11	0	1	1	1
Mississippi [2]	0	0	6	10	0	0	1	0
West South Central States:								
Arkansas	0	0	10	17	2	1	1	0
Louisiana	1	0	13	15	4	0	4	5
Oklahoma [4]	1	0	0	34	15	2	4	1
Texas [3]	2	0	125	57	5	1	14	2
Mountain States:								
Montana	0	0	35	103	20	14	2	0
Idaho	0	0	40	31	2	2	1	0
Wyoming	0	0	40	45	0	0	0	0
Colorado	0	0	67	108	4	1	1	0
New Mexico	1	0	22	88	0	1	8	2
Arizona	0	0	16	27	0	0	0	0
Utah [2]	0	0	35	96	0	1	0	0
Pacific States:								
Washington	0	0	35	101	10	11	2	2
Oregon [5]	1	0	39	43	38	2	0	2
California	0	5	236	347	18	14	4	2
Total	18	18	7,900	8,652	355	272	112	111
First 11 weeks of year	239	202	73,363	86,609	3,297	2,445	1,213	1,060

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 20, 1937, 27 cases, as follows: North Carolina, 2; Georgia, 7; Florida, 4; Alabama, 7; Texas, 7.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Mar. 20, 1937, Oregon, 2 cases.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
Idaho	2	3	394		227		1	92	16	4
Illinois	34	158	827	3	109	1	2	2,427	129	12
Maryland	16	36	1,549	3	1,681	3	0	183	0	4
Michigan	11	65	50	1	204		5	3,060	5	18
Minnesota	7	19	159		89		1	682	45	2
Mississippi	1	17	24,025	1,076	1,577	163	4	32	2	9
Missouri	16	108	6,295	7	51		0	1,493	307	11
New York	53	135		5	1,403			3,513	11	28
Ohio	28	96	2,082	1	237		2	1,358	18	8
Oklahoma [1]	11	26	4,200	10	53	1	4	136	10	7
Pennsylvania	37	186		1	778		2	2,744	0	23
South Carolina		100	4,565	414	138	58	0	25	0	10
South Dakota	10	3	187		7		1	299	12	1

[1] Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

February 1937

	Cases
Actinomycosis:	
Minnesota	1
Anthrax:	
New York	1
Pennsylvania	1
Chicken pox:	
Idaho	115
Illinois	1,586
Maryland	571
Michigan	1,572
Minnesota	506
Mississippi	664
Missouri	384
New York	2,775
Ohio	1,935
Oklahoma [1]	41
Pennsylvania	4,397
South Carolina	82
South Dakota	52
Conjunctivitis:	
Oklahoma [1]	1
Dengue:	
South Carolina	1
Diarrhea:	
Maryland	7
Ohio (under 2 years; enteritis included)	13
South Carolina	180
Dysentery:	
Illinois (amoebic)	9
Illinois (amoebic carriers)	14
Illinois (bacillary)	12
Maryland (bacillary)	6
Michigan (bacillary)	1
Minnesota (amoebic) [2]	13
Mississippi (amoebic)	72
Mississippi (bacillary)	180
Missouri	1
New York (amoebic)	4
New York (bacillary)	23
Ohio (bacillary)	1
Oklahoma [1]	2
Encephalitis, epidemic or lethargic:	
Idaho	1
Illinois	6
Maryland	1
Michigan	1
Missouri	1
New York	7
Ohio	1
Pennsylvania	1
German measles:	
Idaho	3
Illinois	33
Maryland	53
Michigan	190
New York	113
Ohio	42
Pennsylvania	116

February 1937—Continued

	Cases
Hookworm disease:	
Mississippi	231
South Carolina	196
Impetigo contagiosa:	
Maryland	11
Lead poisoning:	
Michigan	2
Ohio	13
Leprosy:	
Ohio	1
Mumps:	
Idaho	32
Illinois	492
Maryland	896
Michigan	1,473
Mississippi	1,068
Missouri	68
Ohio	226
Oklahoma [1]	16
Pennsylvania	1,922
South Carolina	66
South Dakota	5
Ophthalmia neononatorum:	
Illinois	2
Maryland	2
Mississippi	4
New York [3]	10
Ohio	57
Oklahoma [1]	3
Pennsylvania	2
South Carolina	6
Paratyphoid fever:	
Illinois	2
Minnesota	2
Mississippi	9
New York	2
Ohio	2
South Carolina	2
Puerperal septicemia:	
Mississippi	32
Ohio	3
Rabies in animals:	
Illinois	31
Maryland	1
Michigan	6
Mississippi	24
Missouri	4
New York [3]	1
South Carolina	30
Rabies in man:	
Illinois	1
Ohio	1
Scabies:	
Oklahoma [1]	1
Septic sore throat:	
Idaho	5
Illinois	16
Maryland	17
Michigan	34
Minnesota	9
Missouri	30
New York	66

February 1937—Continued

	Cases
Septic sore throat—Con.	
Ohio	139
Oklahoma [1]	17
Tetanus:	
Illinois	1
New York	2
South Carolina	1
Trachoma:	
Michigan	1
Mississippi	1
Missouri	28
Ohio	1
Oklahoma [1]	23
South Dakota	1
Trichinosis:	
Illinois	1
New York	5
Tularemia:	
Illinois	12
Michigan	2
Minnesota	2
Missouri	8
Ohio	4
Oklahoma [1]	1
Pennsylvania	1
South Carolina	5
Typhus fever:	
Maryland	1
New York	4
South Carolina	5
Undulant fever:	
Illinois	6
Maryland	2
Michigan	7
Minnesota	4
Mississippi	6
Missouri	1
New York	9
Ohio	1
Oklahoma [1]	3
Pennsylvania	10
Vincent's infection:	
Idaho	3
Illinois	20
Maryland	9
Michigan	14
New York [3]	67
Oklahoma [1]	3
Whooping cough:	
Idaho	22
Illinois	702
Maryland	401
Michigan	943
Minnesota	268
Mississippi	315
Missouri	457
New York	1,527
Ohio	1,368
Oklahoma [1]	6
Pennsylvania	2,301
South Carolina	143
South Dakota	5

[1] Exclusive of Oklahoma City and Tulsa.
[2] Eleven 1936 delayed reports included.
[3] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 13, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	245	731	142	6,594	1,006	2,646	20	414	22	1,444	------
Current week [1]	143	643	155	2,711	935	2,623	60	419	26	1,470	------
Maine:											
Portland	0	------	0	0	5	4	0	0	0	3	31
New Hampshire:											
Concord	0	------	0	0	2	0	0	1	0	0	9
Manchester	0	------	3	0	2	0	0	1	0	0	20
Nashua	0	------	------	0	1	0	0	------	0	1	------
Vermont:											
Barre	0	------	0	1	0	0	0	1	0	13	4
Burlington	0	------	0	0	0	2	0	0	0	0	9
Rutland	0	------	1	3	1	0	0	0	0	3	9
Massachusetts:											
Boston	0	------	1	3	17	68	0	9	0	155	266
Fall River	0	------	0	23	4	0	0	0	0	9	30
Springfield	0	------	0	13	1	6	0	1	0	18	41
Worcester	0	------	0	221	8	4	0	4	0	26	58
Rhode Island:											
Pawtucket	0	------	0	7	0	3	0	0	0	0	24
Providence	1	------	0	201	13	50	0	1	0	0	73
Connecticut:											
Bridgeport	0	2	2	21	7	42	0	2	0	1	44
Hartford	0	3	0	3	1	6	0	1	0	1	37
New Haven	0	18	0	1	3	9	0	0	0	0	39
New York:											
Buffalo	0	1	1	95	0	19	0	2	0	47	148
New York	40	47	14	202	191	419	0	94	4	74	1,697
Rochester	1	------	1	1	4	7	0	2	0	12	65
Syracuse	0	------	2	17	1	79	0	0	0	39	52
New Jersey:											
Camden	3	6	6	0	6	4	0	0	0	5	46
Newark	0	1	0	654	13	22	0	7	0	26	136
Trenton	0	------	0	0	3	7	0	1	0	8	38
Pennsylvania:											
Philadelphia	7	17	8	15	47	213	0	25	0	78	606
Pittsburgh	8	9	5	34	20	62	0	3	0	32	186
Reading	0	------	1	9	10	11	0	2	0	13	49
Ohio:											
Cincinnati	3	7	1	59	5	22	0	8	2	6	133
Cleveland	2	30	5	13	28	54	0	18	0	77	107
Columbus	0	1	1	1	7	6	0	6	0	20	109
Toledo	0	6	4	37	3	11	0	4	0	36	88
Indiana:											
Anderson	0	------	0	1	3	10	0	1	0	7	13
Fort Wayne	2	------	1	1	3	4	0	1	0	2	22
Indianapolis	1	------	1	3	21	59	0	6	0	20	128
Muncie	0	9	0	0	2	1	0	0	0	0	13
South Bend	0	------	0	0	2	3	0	0	0	20	16
Terre Haute	4	------	0	0	0	3	0	0	0	0	22
Illinois:											
Alton	1	------	0	2	0	10	0	0	0	2	9
Chicago	10	31	8	37	69	286	0	81	1	78	755
Elgin	0	------	0	0	0	0	0	0	0	2	6
Moline	0	1	0	0	0	2	0	1	0	7	5
Springfield	0	1	0	1	4	2	0	0	0	7	19
Michigan:											
Detroit	10	3	2	10	37	531	0	15	0	75	300
Flint	0	------	0	10	7	16	0	1	0	2	23
Grand Rapids	0	------	0	19	5	17	0	0	0	13	31
Wisconsin:											
Kenosha	0	------	0	1	0	1	0	0	0	1	6
Madison	0	------	0	1	0	6	0	0	0	12	19
Milwaukee	1	2	2	4	5	77	0	5	1	15	101
Racine	0	------	0	0	2	3	0	1	0	0	12
Superior	0	------	0	0	1	1	0	0	0	2	7
Minnesota:											
Duluth	0	------	0	1	1	9	0	1	0	7	27
Minneapolis	1	------	3	2	8	23	0	5	1	32	128
St. Paul	0	------	0	3	4	23	0	1	0	74	56

[1] Figures for Topeka and Little Rock estimated; current reports not received.

City reports for week ended Mar. 13, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0	------	------	0	------	3	0	------	0	2	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	1	3	61	0	------	0	0	23
Sioux City	0	------	------	1	------	13	1	------	0	0	------
Waterloo	0	------	------	1	------	24	0	------	0	21	------
Missouri:											
Kansas City	1	3	3	2	17	95	0	9	2	11	118
St. Joseph	1	------	0	0	2	18	43	1	0	0	25
St. Louis	9	1	1	0	19	73	4	9	0	79	216
North Dakota:											
Fargo	0	------	0	0	0	12	0	0	0	0	8
Grand Forks	0	------	------	0	------	0	0	------	0	2	------
Minot	0	------	0	0	0	1	0	0	0	0	6
South Dakota:											
Aberdeen	0	------	------	0	------	4	0	------	0	0	------
Nebraska:											
Omaha	1	------	0	0	6	5	0	2	0	6	56
Kansas:											
Lawrence	0	------	0	0	2	1	0	0	0	1	6
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	1	1	4	1	7	5	1	0	6	26
Delaware:											
Wilmington	0	------	1	17	6	5	0	1	0	0	36
Maryland:											
Baltimore	3	14	4	659	33	17	0	14	1	62	250
Cumberland	0	------	0	0	3	0	0	1	0	4	12
Frederick	1	------	0	25	2	0	0	0	0	0	5
District of Columbia:											
Washington	7	14	4	106	21	9	0	13	0	12	173
Virginia:											
Lynchburg	0	------	1	0	2	1	0	1	0	11	18
Norfolk	0	------	0	2	5	4	0	4	0	0	23
Richmond	0	------	4	1	10	2	0	0	0	1	59
Roanoke	0	------	0	65	2	0	0	0	0	1	17
West Virginia:											
Charleston	0	2	0	0	7	0	0	1	0	1	41
Huntington	1	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	1	1	2	3	0	0	0	7	16
North Carolina:											
Gastonia	0	------	------	0	------	1	0	------	0	0	------
Raleigh	0	------	0	1	2	0	0	0	0	0	8
Wilmington	0	------	0	0	1	0	0	0	0	0	10
Winston-Salem	0	1	0	2	5	4	0	2	0	7	19
South Carolina:											
Charleston	3	101	4	0	9	2	0	1	0	0	81
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	0	0	1	0	0	0	0	0	6
Greenville	1	------	0	1	1	0	0	2	0	3	6
Georgia:											
Atlanta	1	50	6	1	15	8	0	6	0	2	100
Brunswick	0	------	0	0	1	0	0	0	0	2	2
Savannah	1	37	2	0	2	2	0	2	0	2	39
Florida:											
Miami	0	8	0	1	3	2	0	5	1	1	52
Tampa	1	------	0	2	2	0	0	2	1	0	------
Kentucky:											
Ashland	0	12	------	0	------	4	0	------	0	2	------
Covington	0	2	1	0	1	1	0	0	0	0	15
Lexington	0	5	1	7	5	0	0	2	0	6	25
Louisville	1	------	1	1	15	13	0	3	2	49	83
Tennessee:											
Knoxville	0	------	4	1	7	1	0	0	0	0	41
Memphis	0	------	8	0	14	0	0	9	0	0	99
Nashville	1	------	4	0	10	2	0	2	0	0	57
Alabama:											
Birmingham	0	106	7	0	15	4	0	5	1	3	92
Mobile	0	25	6	0	4	2	0	0	0	0	49
Montgomery	0	26	------	0	------	8	0	------	0	1	------
Arkansas:											
Fort Smith	0	------	------	0	------	1	0	------	0	0	------
Little Rock	------	------	------	------	------	------	------	------	------	------	------
Louisiana:											
Lake Charles	0	------	0	0	4	0	0	1	0	0	9
New Orleans	6	25	5	4	25	6	0	12	10	2	174
Shreveport	0	------	0	2	9	0	0	4	0	4	40

City reports for week ended Mar. 13, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Muskogee	0			0		1	0		0	0	
Oklahoma City	1		1	0	9	6	0	1	1	3	42
Texas:											
Dallas	2	3	2	43	8	20	0	1	0	14	61
Fort Worth	1		0	45	7	8	2	0	0	4	39
Galveston	0		0	0	5	2	0	0	0	0	15
Houston	3		3	0	11	1	0	4	0	8	95
San Antonio	0		2	9	10	4	0	9	0	1	67
Montana:											
Billings	0		0	0	1	5	0	0	0	0	14
Great Falls	0		1	1	1	1	1	0	0	0	6
Helena	0		0	7	1	4	0	0	0	0	2
Missoula	0		0	0	0	0	0	0	0	0	4
Idaho:											
Boise	0		0	0	1	0	0	0	0	0	5
Colorado:											
Colorado Springs	0		0	0	0	2	0	1	0	0	16
Denver	2		2	6	10	20	0	0	0	84	96
Pueblo	0		0	0	0	5	0	0	0	0	12
New Mexico:											
Albuquerque	0		0	0	2	1	0	1	0	6	14
Utah:											
Salt Lake City	0		5	22	3	15	0	3	0	14	51
Nevada:											
Reno											
Washington:											
Seattle	0		1	7	3	2	0	4	0	15	91
Spokane	0	5	5	0	5	0	0	0	0	1	44
Tacoma	0		0	0	2	5	0	1	0	0	31
Oregon:											
Portland	0		2	1	3	5	7	2	1	1	83
Salem	0			0		0	0		0	3	
California:											
Los Angeles	5	43	4	39	32	34	1	30	1	83	453
Sacramento	2	19	0	3	7	9	0	1	0	2	24
San Francisco	4	9	0	2	7	33	0	10	1	19	181

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Maryland:			
Boston	5	3	0	Baltimore	2	2	0
Springfield	1	1	0	District of Columbia:			
Rhode Island:				Washington	3	1	0
Providence	1	1	0	West Virginia:			
New York:				Wheeling	1	0	0
Buffalo	1	1	0	Florida:			
New York	6	3	0	Miami	2	1	0
Pennsylvania:				Kentucky:			
Philadelphia	2	1	0	Lexington	3	1	0
Pittsburgh	4	2	0	Louisville	1	0	1
Ohio:				Tennessee:			
Cincinnati	2	0	0	Knoxville	1	0	0
Cleveland	1	0	0	Alabama:			
Columbus	2	2	0	Birmingham	6	1	0
Toledo	1	0	0	Louisiana:			
Indiana:				New Orleans	1	0	0
Indianapolis	1	0	0	Shreveport	0	1	0
Illinois:				Oklahoma:			
Chicago	3	3	0	Muskogee	1	0	0
Michigan:				Texas:			
Detroit	1	0	0	Dallas	0	1	0
Minnesota:				Houston	0	1	0
Minneapolis	0	1	0	San Antonio	3	3	0
Iowa:				Washington:			
Des Moines	1	0	0	Seattle	1	0	0
Missouri:				California:			
St. Joseph	1	0	0	Los Angeles	3	1	0
St. Louis	1	0	0	San Francisco	1	0	0
Delaware:							
Wilmington	0	1	0				

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Toledo, 2; Grand Rapids, 1.
Pellagra.—Cases: Winston-Salem, 1; Charleston, S. C., 1; Atlanta, 2; Savannah, 1.
Rabies in man.—Deaths: Columbus, 1.
Typhus fever.—Cases: New York, 1; Atlanta, 1; Savannah, 1; Los Angeles, 1.

FOREIGN AND INSULAR

CANADA

Vital statistics—Third quarter 1936.—The Bureau of Statistics of the Dominion of Canada has published the following preliminary statistics for the third quarter of 1936. The rates are computed on an annual basis. There were 19.8 live births per 1,000 population during the third quarter of 1936 and 20.7 per 1,000 population in the same quarter of 1935. The death rate was 8.7 per 1,000 population for the third quarter of 1936 and 8.7 per 1,000 population for the same quarter of 1935. The infant mortality rate for the third quarter of 1936 was 56 per 1,000 live births and 63 per 1,000 live births in the corresponding quarter of 1935. The maternal death rate was 4.8 per 1,000 live births for the third quarter of 1936 and 4.2 per 1,000 live births for the same quarter of 1935.

The accompanying tables give the numbers of births, deaths, and marriages by Provinces for the third quarter of 1936, and deaths from certain causes in Canada for the third quarter of 1936, and the corresponding quarter of 1935, and by Provinces for the third quarter of 1936.

Number of births, deaths, and marriages, third quarter 1936

Province	Live births	Deaths (exclusive of still-births)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	55,077	24,105	3,084	262	24,765
Prince Edward Island	533	208	29	2	219
Nova Scotia	2,725	1,102	157	2	1,267
New Brunswick	2,584	1,026	168	11	1,149
Quebec	18,653	7,078	1,294	88	7,668
Ontario	15,896	8,881	768	84	8,339
Manitoba	3,308	1,558	205	19	1,662
Saskatchewan	4,972	1,377	206	20	1,362
Alberta	3,711	1,297	165	21	1,538
British Columbia	2,695	1,068	92	18	1,511

[1] Exclusive of Yukon and the Northwest Territories.

Number of deaths, Canada, third quarter of 1936 and 1935, and by Provinces for third quarter of 1936

Cause of death	Canada[1] (third quarter)		Province, third quarter 1936								
	1935	1936	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	410	462	8	11	10	151	186	22	22	27	30
Cancer	2,833	2,850	30	148	108	667	1,120	208	188	143	238
Diarrhea and enteritis	1,241	803	2	32	28	366	182	76	65	33	19
Diphtheria	46	49		1	3	29	8	3	3	2	
Diseases of the arteries	1,869	1,997	15	86	77	370	1,016	106	83	98	146
Diseases of the heart	3,360	3,543	21	149	149	889	1,486	224	151	173	301
Homicides	43	24				8	9	2	2	1	2
Influenza	221	225		11	1	87	73	13	12	24	4
Measles	45	53			4	9	8	21	7	2	2
Nephritis	1,435	1,379	16	62	51	630	393	50	52	41	84
Pneumonia	901	979	12	39	49	286	320	77	59	62	75
Poliomyelitis	27	37		1		3	10	22	1		
Puerperal causes	237	262	2	2	11	88	84	19	20	21	15
Scarlet fever	31	41		1		24	14		1	1	
Suicides	220	212	1	4	5	31	82	20	21	21	27
Tuberculosis	1,563	1,587	9	111	86	706	302	90	62	92	129
Typhoid fever and paratyphoid fever	94	78	2	3	4	36	16	3	7	5	2
Whooping cough	132	132	3	20	3	32	30	1	12	26	5
Other violent deaths	1,468	2,060	13	57	40	309	1,162	147	102	117	113

[1] Exclusive of Yukon and the Northwest Territories.

CUBA

Provinces—Notifiable diseases—4 weeks ended March 6, 1937.—During the 4 weeks ended March 6, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1		7	1	2	11
Chicken pox		1	3	2		2	8
Diphtheria		1	6			3	10
Dysentery (amoebic)			1				1
Leprosy	6	2	5	2		3	18
Malaria	84	33	13	87	113	508	838
Measles	92	5	13			5	115
Poliomyelitis			3		2		5
Scarlet fever				1			1
Tetanus (infantile)				1			1
Trachoma				13			13
Tuberculosis	17	14	89	48	42	40	250
Typhoid fever	11	52	8	21	9	23	124
Yaws						1	1

CZECHOSLOVAKIA

Communicable diseases—January 1937.—During the month of January 1937 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	3		Paratyphoid fever	5	
Cerebrospinal meningitis	11	2	Poliomyelitis	5	
Chicken pox	257		Puerperal fever	38	11
Diphtheria	2,218	140	Scarlet fever	1,771	83
Dysentery	1	1	Trachoma	41	
Influenza	20,989	115	Typhoid fever	445	42
Lethargic encephalitis	1	1	Typhus fever	15	1
Malaria	5				

ITALY

Communicable diseases—4 weeks ended January 3, 1937.—For the 4 weeks ended January 3, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Dec. 7-13		Dec. 14-20		Dec. 21-27		Dec. 28, 1936-Jan. 3, 1937	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	19	19	18	18	9	9	19	18
Cerebrospinal meningitis	8	8	10	10	12	12	22	17
Chicken pox	478	157	625	187	415	137	355	142
Diphtheria	621	318	626	327	562	301	567	320
Dysentery	15	8	10	9	7	5	8	7
Hookworm disease	5	4			2	2	3	2
Lethargic encephalitis	4	4	4	4	2	2	2	2
Measles	1,111	189	1,140	199	919	184	881	177
Mumps	308	99	529	82	269	77	274	84
Paratyphoid fever	27	22	35	25	27	24	22	20
Poliomyelitis	22	21	18	17	26	23	12	11
Puerperal fever	47	43	35	32	33	31	45	44
Scarlet fever	387	158	354	145	294	125	279	122
Typhoid fever	335	185	312	172	264	156	216	132
Undulant fever	37	32	34	23	26	21	35	27
Whooping cough	342	109	373	120	320	112	321	104

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for March 26, 1937, pages 372-385. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued April 30, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Indochina—Cochinchina—Chaudoc.—During the week ended March 13, 1937, cholera was reported present in Chaudoc, Cochinchina, Indochina.

Plague

Argentina—Salta Province—Metan.—During the period January 16–31, 1937, 1 case of plague was reported in Metan, Salta Province, Argentina.

Bolivia—Department of Chuquisaca—Villa Serrano.—During the month of January 1937, plague was reported present in Villa Serrano, Department of Chuquisaca, Bolivia.

Hawaii Territory—Hawaii Island—Hamakua District—Paauhau Sector.—A rat found March 18, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been proved plague-infected.

Smallpox

British West Africa—Gambia—MacCarthy Island.—During the week ended March 13, 1937, smallpox was reported present in MacCarthy Island, Gambia, British West Africa.

Ceylon—Colombo.—During the week ended February 27, 1937, 1 case of smallpox was reported in Colombo, Ceylon.

Typhus Fever

Bolivia.—During the month of January 1937, typhus fever was reported in Bolivia as follows: La Paz, La Paz Department, 20 cases; Oruro, Oruro Department, 2 cases; Potosi, Potosi Department, 2 cases.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Entre Rios, Matto Grosso State, February 12, 1937, 1 fatal case; Guaxupe, Minas Geraes State, February 8, 1937, 1 fatal case.

French Equatorial Africa—Gabon—Libreville.—On March 14, 1937, 1 suspected case of yellow fever was reported in Libreville, Gabon, French Equatorial Africa.

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THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 52 APRIL 9, 1937 NO. 15

THE TREATMENT OF BLACKTONGUE WITH A PREPARATION CONTAINING THE "FILTRATE FACTOR", AND EVIDENCE OF RIBOFLAVIN DEFICIENCY IN DOGS

By W. H. SEBRELL, R. H. ONSTOTT, and D. J. HUNT, *Passed Assistant Surgeons, United States Public Health Service, National Institute of Health*

Kline, Keenan, Elvehjem, and Hart (*1*), Elvehjem and Koehn (*2*), Jukes and Lepkovsky (*3, 4, 5, 6*), and Lepkovsky, Jukes, and Krause (*7*) have shown the presence in the vitamin B complex of a substance distinct from vitamins B_1, B_6, and riboflavin, which has been designated as the "chick pellagra vitamin", "filtrate factor", etc.

Koehn and Elvehjem (*8*) have reported the successful treatment of blacktongue in dogs with a liver concentrate containing the filtrate factor (their vitamin B_2) and free of riboflavin. These authors suggest that the blacktongue-preventive factor and the filtrate factor are identical.

Fouts, Lepkovsky, Helmer, and Jukes (*9*) have reported two cases of pellagra which were apparently benefited by treatment with a liver preparation containing the "filtrate factor", and free of vitamins B_1, B_6, and lactoflavin. However, Jukes (*6*) has presented evidence that the distribution of the filtrate factor and the pellagra- or blacktongue-preventive factor in foods is not parallel. Therefore, it was felt that it would be desirable to determine the curative value in blacktongue of a preparation containing the "filtrate factor" made from rice bran.

Through the cooperation of Drs. Samuel Lepkovsky and T. H. Jukes, we were furnished with a supply of rice bran filtrate designated by them as K–37–A and which they found to be rich in the filtrate factor (20 chick units per cc) and free of vitamin B_1 and riboflavin.

EXPERIMENTAL

Five dogs (Nos. 317, 331, 340, 341, and 343) were placed on our basic blacktongue-producing diet No. 123, the composition of which is given in table 1. On the development of symptoms of blacktongue, treatment was started with rice bran filtrate K–37–A by stomach tube, in gelatin capsules, or mixed with a small portion of the diet which was eaten before the remainder of the dog's ration was fed. Treatment was discontinued when the symptoms subsided and started

again when early signs of recurrence appeared. The significant details in regard to each of the experimental animals are as follows:

TABLE 1.—*Composition of basic blacktongue-producing diet No. 123* [1]

Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	400	33.6	18.8	296.0
Cowpeas (Vigna sinesis) [3]	50	10.7	.7	30.4
Casein (purified) [4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked in a double boiler of enamelware for about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and this finished mixture is served to the dog *ad libitum*.
[2] Whole maize meal (white) sifted as for human consumption.
[3] The variety known as the California black-eyed pea.
[4] Commercial casein leached for a week in daily changes of acidulated water.

Dog No. 317

September 9, 1936: Begins diet 123 in good condition. Weight yesterday, 8.7 kilos.

November 3: Fifty-five days from the beginning of the experiment shows redness of the buccal mucosa suggestive of early blacktongue. Weighs 9.9 kilos. Average daily food consumption from beginning of experiment to date, 679 grams.

January 5: Weighs 7.2 kilos.

November 4–January 17: Showed varying degrees of redness of the buccal mucosa which never became sufficiently extensive to warrant a definite diagnosis of blacktongue. Average daily food consumption during this period, 167 grams.

January 18: Bright red patches on the mucosa of each side of upper lip. Thin pseudomembrane present on the mucosa of the right cheek and on the soft palate. The floor of the mouth is intensely injected. Diagnosis: Acute blacktongue, 131 days from beginning of experiment. Given 16 cc of rice bran filtrate K–37–A in capsules. All regurgitated in a few minutes.

January 19: Lesions of blacktongue much more extensive. Moribund. Weighs 6.6 kilos.

January 20: Found dead 133 days from beginning of experiment and 2 days after onset of acute blacktongue.

Comment.—Although the symptoms were not extensive enough to warrant a definite diagnosis of blacktongue until 131 days from the beginning of the experiment, the minor degrees of redness of the buccal mucosa which began 55 days from the beginning of the experiment probably represent transient early symptoms of blacktongue. The very low food consumption and rapid loss in body weight during this period render the animal unsatisfactory for experimental purposes and probably account in some measure for the failure to develop typical buccal lesions until two days before death. Since the rice bran filtrate was regurgitated immediately after administration, this animal cannot be considered of any significance in this experiment.

Dog No. 331

September 9, 1936: Begins diet 123 in good condition. Weight yesterday, 7.4 kilos.

November 3: Weighs 7.0 kilos. Fifty-five days from the beginning of the experiment shows reddened patches on mucosa of each side of the upper lip. The mucosa of the cheek and the floor of the mouth are diffusely reddened, suggestive of a beginning attack of blacktongue. Average daily food consumption from beginning of experiment to date, 789 grams.

November 4: The buccal lesions noted yesterday are more severe. Given 10 cc of rice bran filtrate K–37–A mixed with a small amount of the diet.

November 5: Given 10 cc of rice bran filtrate K–37–A mixed with small amount of the diet.

November 6: Buccal lesions have disappeared except for slight redness of the mucosa of the cheeks.

November 24: Weighs 7.2 kilos. Seventy-six days from the beginning of the experiment presents bright red patches on mucosa of each side of the upper lip. Intense reddening of the mucosa of the cheeks and floor of mouth. Slight reddening of the margins of the tongue.

November 25: The buccal lesions are more severe. Given 5 cc of rice bran filtrate K–37–A mixed with a small amount of the diet.

November 26–30: The buccal lesions have considerably receded, although some redness of the mucosa has persisted.

December 1: Weighs 7.2 kilos. Definite recurrence of blacktongue. Red band-like lesion on the mucosa of each side of the upper lip. The mucosa of the cheeks and floor of the mouth is intensely injected. Given 5 cc of rice bran filtrate K–37–A in capsules.

December 2: The buccal lesions are definitely improved.

December 3–7: Given 5 cc of rice bran filtrate K–37–A in small portion of the diet daily.

December 8: Mouth appears to be entirely normal.

December 22: First signs of recurrence of blacktongue. Redness of the mucosa of each side of the upper lip, cheeks, and floor of the mouth. Given 5 cc of rice bran filtrate K–37–A in small portion of the diet.

December 28: Mouth normal.

November 4–January 4: Daily average food consumption 552 grams during this period.

January 5: Weighs 7.7 kilos.

January 5–February 21: During this period a dose of 5 cc of rice bran filtrate K–37–A was given at the first evidence of reddening of the buccal mucosa and in each instance was followed by disappearance of symptoms. Eleven such doses were given. The average daily food consumption was 208 grams.

February 22: Again shows faint redness of the floor of the mouth. Given 10 cc rice bran filtrate K–37–A.

February 23: Weighs 5.3 kilograms. Buccal mucosa appears unusually pale.

February 27: Found dead, 171 days from the beginning of the experiment and 116 days after onset of blacktongue. At autopsy no lesions of blacktongue were found and the cause of death could not be determined. A total of 115 cc of the rice bran filtrate K–37–A was given over a period of 115 days.

Dog No. 340

September 9, 1936: Begins diet 123 in good condition. Weight yesterday, 7.8 kilos.

September 22: Thirteen days from the beginning of the experiment shows first signs of blacktongue—an irregular red band-like lesion on the mucosa of each side of the upper lip, reddening of the mucosa of the cheeks and floor of the mouth.

September 26: Symptoms of blacktongue well established. Given 30 cc of rice bran filtrate K–37–A by stomach tube. Vomited afterward.

September 27: Given 30 cc rice bran filtrate K–37–A by stomach tube. Vomited afterward.

September 28: Symptoms of blacktongue receding. Given 15 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

September 29: Weighs 8.3 kilos. Given 15 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

September 30: The lesions of blacktongue have disappeared except for a faint reddening of the mucosa of the upper lip and left cheek.

October 13–March 22: During this period the animal showed varying degrees of reddening of the buccal mucosa typical of early symptoms of recurring attacks of blacktongue and was treated with daily doses of 5 or 10 cc of rice bran filtrate K–37–A, which were discontinued during the intervals in which the lesions on the buccal mucosa showed improvement or disappeared. A total of 505 cc of rice bran filtrate K–37–A was given during this period.

March 23: Weighs 8.7 kilos.

March 24: Apparently normal at 8 a. m. At 9:30 a. m. in semicomatose condition, unable to stand. Given 3 mg of riboflavin (L. F. 356)[1] intramuscularly. At 2 p.m. animal appears to be slightly improved; given 3 mg of riboflavin (L. F. 356) intramuscularly. At 4 p. m. is able to walk, but still appears weak. At 9 p. m. apparently normal; given 2 mg of L. F. 356.

March 25: Animal appears to be entirely normal.

March 27: Normal except for faint injection of mucosa of upper lip. Given 10 cc rice bran filtrate K–37–A. The animal is still alive 199 days after the beginning of the experiment and 186 days after the onset of blacktongue, a total of 605 cc of rice bran filtrate K–37–A having been given over a period of 185 days.

Dog No. 341

September 9, 1936: Begins diet 123 in good condition. Weight yesterday, 9.0 kilos.

November 10–21: Slight, transient redness of the buccal mucosa of doubtful significance.

December 1: Weighs 8.5 kilos. Eighty-three days from the beginning of the experiment presents a broad, red streak on the mucosa of each side of the upper lip, injection of the mucosa of the cheeks and floor of the mouth, and reddening of the margins of the tongue. Given 5 cc of rice bran filtrate K–37–A in gelatin capsules.

December 3: Given 10 cc of rice bran filtrate K–37–A mixed with a small portion of the diet.

December 4: Buccal lesions are much improved. Given 5 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 5: Mouth is entirely normal except for a very slight injection of the mucosa of the upper lip. Given 5 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 18–January 12: During this period the animal showed varying degrees of injection of the floor of the mouth and was treated with a daily dose of

[1] This material was a 0.05-percent solution furnished in sealed ampules of 2 cc through the courtesy of Mr. John Hart, of the Winthrop Chemical Co., Inc.

5 cc of rice bran filtrate K–37–A, which was discontinued as the symptoms improved or disappeared. A total of 40 cc of rice bran filtrate was given during this period.

January 12: Weighs 8.7 kilos.

January 13: Entirely normal except for unusual paleness of the buccal mucosa.

January 23: Appears to be in good condition. Buccal mucosa is pale.

January 24: Found dead in the morning, 137 days from the beginning of the experiment and 54 days after the onset of blacktongue. No evidence of blacktongue at autopsy. Cause of death undetermined. A total of 65 cc of rice bran filtrate K–37–A was given over a period of 54 days.

Dog No. 343

September 9, 1936: Begins diet 123 in good condition. Weight yesterday 8.6 kilos.

November 3: Fifty-five days from the beginning of the experiment presents first sign of an attack of blacktongue—a narrow red band on the mucosa of each side of the upper lip and a diffuse reddening of the cheeks and floor of the mouth.

November 4: Weighs 7.5 kilos. The symptoms of blacktongue are more pronounced. Given 10 cc of rice bran filtrate K–37–A mixed with a small portion of the diet.

November 5: The buccal symptoms are receding. Given 10 cc of rice bran filtrate K–37–A mixed with a small portion of diet.

November 9: Mouth normal.

November 11–December 1: Average daily food consumption during this period, 166 grams. There were slight transient symptoms consisting of reddening of the buccal mucosa.

December 1: Weighs 6.7 kilos.

December 2: Begins recurrence of acute attack of blacktongue.

December 3: Buccal lesions have progressed to pseudomembrane formation on the mucosa of the cheeks and along the margins of the tongue. Given 10 cc rice bran filtrate K–37–A mixed with a small portion of diet.

December 4: Given 10 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 5: Given 10 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 6: Given 5 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 7: Given 10 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 8: Given 10 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 9: Buccal lesions show marked improvement. There are small healing ulcers on the mucosa of the upper lip, and only very small patches of pseudomembrane remain on the mucosa of the cheeks.

December 10: Given 5 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 16: Given 5 cc rice bran filtrate K–37–A mixed with a small portion of the diet.

December 18: Mouth is normal.

December 24–February 26: During this period had symptoms of blacktongue of varying degrees of severity which promptly receded on administration of doses of 5 or 10 cc of rice bran filtrate K–37–A. A total dosage of 180 cc of rice bran filtrate K–37–A was given.

February 27: Mouth normal.

February 28: Found in a comatose condition early in the morning and died a few minutes later. Death occurred 172 days from the beginning of the experiment and 117 days after the onset of blacktongue. At autopsy no evidence of blacktongue was found. The liver was pale and had a yellowish appearance. The cause of death was undetermined. A total of 280 cc of rice bran filtrate K-37-A was given over a period of 117 days.

SUMMARY

All five of the animals developed typical signs of acute blacktongue in 131, 55, 13, 83, and 55 days from the beginning of the experiment. One animal (dog no. 317) died in the first acute attack of blacktongue without treatment (the one dose given was regurgitated). The symptoms of blacktongue in the other four animals promptly subsided following treatment with the rice bran filtrate K-37-A, and each recurrent attack subsided on repeated treatment with this material. These results indicate that the rice bran filtrate K-37-A has blacktongue-preventive value and therefore contains the blacktongue-preventive factor in addition to the chick antidermatitis factor, or that the two substances are identical. Three of the animals (dogs nos. 331, 341, and 343) died in 115, 54, and 117 days, respectively, from the beginning of treatment, and 171, 137, and 172 days from the beginning of the experiment, without any signs of blacktongue at the time of death. Their sudden collapse and death appeared to be similar to the condition previously described in this laboratory as "yellow liver" (*10, 11*) and which may be the same condition encountered by Zimmerman and Burack (*12*), Spies and Dowling (*13*), Zimmerman, Cowgill, and Fox (*14*), and other workers feeding dogs diets deficient in one or more components of the vitamin B_2 complex. It has been our experience with dogs having the condition described as "yellow liver" that the appearance of coma or a semicomatose condition invariably progresses to death within a short time, similar to the sudden deaths of the three animals in this experiment.

While this experiment was in progress we observed that rats on a riboflavin-deficient diet had yellowish livers similar in gross appearance at autopsy to those previously seen in the dogs. Therefore, when the remaining animal (dog no. 340) suddenly collapsed in a semicomatose condition 182 days from the beginning of treatment and 196 days from the beginning of the experiment, without any signs of blacktongue, and its condition appeared to be identical with that which just preceded the death of these other animals, it was immediately treated with a solution of riboflavin (L. F. 356) which Sebrell, Hunt, and Onstott (*15*) have shown is without value in the treatment of blacktongue. During the day a total dosage of 8 milligrams was given intramuscularly. Within 12 hours from the first dose of this material (3 milligrams), the animal had returned to normal.

This strongly suggests that the basic blacktongue-producing diet no. 123 is deficient in riboflavin, as well as in the blacktongue-preventive factor, and that this deficiency in riboflavin is the cause of the collapse and sudden death of the animals in this experiment without symptoms of blacktongue at the time of death. It also suggests that the condition we have described as "yellow liver" in dogs is the result of riboflavin deficiency.

The animals did not live long enough to make the experiment a conclusive demonstration of the blacktongue-preventive value of the rice bran filtrate, although the fact that symptoms of blacktongue subsided following treatment with relatively small doses in all of the animals, that four of the animals lived for 115, 185, 54, and 117 days after treatment was started, and that there were no symptoms of blacktongue at the time of death, strongly indicate that this material contains a considerable amount of the blacktongue-preventive factor. During the treatment period the total amount of rice bran filtrate K–37–A given each animal (nos. 331, 340, 341, and 343) was calculated to average 0.14 cc, 0.37 cc, 0.13 cc, and 0.34 cc per kilogram of body weight per day, respectively.

The results of this experiment suggest that there may be considerable danger in treating cases of human pellagra with purified preparations of the pellagra-preventive factor, since the absence of unrecognized dietary essentials in these preparations might lead to unfavorable results from conditions other than pellagra.

CONCLUSIONS

1. A rice bran filtrate K–37–A, reported rich in the "filtrate factor" and free of riboflavin, showed curative action in blacktongue of dogs.
2. Some evidence is presented that riboflavin is a dietary essential for dogs.

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LABILE BACTERIAL ANTIGENS AND METHODS OF PREPARING AND PRESERVING THEM[1]

By STUART MUDD, M. D., *Professor of Bacteriology, University of Pennsylvania,* E. J. CZARNETZKY, Ph. D., HORACE PETTIT, M. D., and DAVID LACKMAN, *Department of Bacteriology, University of Pennsylvania*[2]

Progress in any branch of chemistry is necessarily limited until single reagents become available. In particular, investigation of the chemical and serological mechanisms underlying infectious disease has been limited by lack of pure reagents in the form of single, native antigens and antibodies. Practical procedures such as active and passive immunization and serum therapy have suffered similar limitations from the fact that the immunizing agents used have been complex, frequently toxic and have often undergone serious alteration in the course of preparation.

Discoveries of the past few years have particularly served to emphasize the lability of a number of essential immunizing antigens; the Vi antigen of the typhoid bacillus (*1*), the capsular polysaccharide of the pneumococcus (*2*), the labile agglutinogen of vaccinia bodies (*3*), and the labile antigens of hemolytic streptococci (*4*), serve as examples of antigens whose activity could not withstand the classical methods of chemical extraction and purification.

The capsular polysaccharides of pneumococcus types I, II, and III have recently been separated in closer approximation to their native state (*2*), utilizing the chloroform method of Sevag (*5*). The Vi typhoid antigen has been obtained in this laboratory (*6*) in cell-free, immunizing form, after disintegration of virulent typhoid bacilli by intense sonic vibration of audible frequency in the laboratories of the Johnson Foundation for Medical Physics of the University of Pennsylvania (*7*). The labile surface antigen of *Streptococcus hemolyticus* (Lancefield Group A) has been isolated in antigenic form following disintegration of the streptococci by each of three physical methods:

1. The bacteria, in a dense suspension, are disintegrated by intense sonic vibrations of audible frequency (*7*). This method is satisfactory if equipment is available.

2. The streptococci are dried *in vacuo* from the frozen state (*8*), are transferred to a mortar, and liquid air is poured on them. They are ground with a pestle as the liquid air evaporates (*9*). This method is effective, but we have discontinued its use because of the danger of explosion of the liquid oxygen in the presence of organic matter, and because of the tendency of the gases evolved to scatter viable bacteria.

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[1] Read before the American Philosophical Society, Philadelphia, Pa., on Jan. 2, 1937.

[2] This work has been aided by grants from the United States Public Health Service and from the Abington Memorial Hospital.

3. The streptococci are grown in mass culture, centrifugalized at high speed, and then transferred in the form of a heavy suspension directly to a special ball-mill. The mill with the bacteria in it is attached to a high vacuum line with a condenser interposed, and the bacteria are dried from the frozen state by the lyophile process (*8*). When the bacteria are dry, the mill is attached to a motor, and is operated in a bath of Dry-Ice in Methyl Cellosolve (*10*).

After disintegration by any of these three methods the bacterial residue is taken up in saline solution and centrifugalized, and the supernatant fluid is passed through a bacterial filter. The labile surface antigen is isolated from the filtrate by bringing the solution to a certain pH on the acid side of neutrality. The antigen flocculates and may be sedimented in the centrifuge. The sediment is soluble in 0.85 percent NaCl solution. The antigen may be purified by solution in 70 percent ethyl alcohol, with subsequent removal of the alcohol by distillation under high vacuum at 10° C.

Absorption of immune rabbit serum with the homologous labile antigens so prepared completely removes the type-specific antibodies which cause agglutination, promote phagocytosis, and confer on mice passive protection against streptococci of the corresponding type. Injected into rabbits these labile antigens elicit antibodies.

These antigens if kept for a few days in the refrigerator or heated for 1 hour at 56° C. lose completely their power of combining with homologous antibody. This inactivation has been shown to be an oxidation reaction which is readily reversible. Thus when stored or heated in the presence of such reducing agents as cysteine or thioglycolic acid the antigen retains its activity; if inactivated by oxidation, the ability to combine with antibody may be restored by reduction with cysteine or thioglycolic acid.

When reduced by sodium bisulphite the labile antigen becomes lytic for red blood cells. Indeed it appears possible that labile antigen so reduced is the oxygen-labile streptolysin studied in culture filtrates by Neill and Mallory (*11*) and by Todd (*12*).

Classification of the β-hemolytic streptococci into serological groups, which correspond broadly to grouping on the basis of pathogenicity and of biochemical reactions, has been accomplished by Lancefield (*13*). This classification depends upon the presence in each group of a characteristic carbohydrate detectable by the precipitin reaction. The group pathogenic for man (group A) was first subdivided into serological types by Lancefield on the basis of a type-specific protein-like substance "M." The M substances as prepared by Lancefield give type-specific precipitin reactions with homologous antisera, but are not themselves antigenic.

A comprehensive classification of group A hemolytic streptococci into serological types has been achieved by Griffith (*14*) on the basis of agglutination by type-specific sera. The classifications into groups by Lancefield and into types by Griffith are rapidly becoming accepted as standard by workers in the field.

The labile surface antigen, when a part of the bacterial surface, corresponds in distribution and specificity to Griffith's type-specific agglutinogen. When subjected to the chemical procedure used by Lancefield in preparing her type-specific M substance, this labile antigen breaks down into two fractions. One of these fractions exhibits the specificity and other properties of the M substance; the other fraction has the specificity of Lancefield's group carbohydrate. The labile surface antigen may be preserved by the lyophile process.

Another new fraction has also been isolated from β-hemolytic streptococci, although it is not necessary to disrupt the organisms to obtain it (*15*). It can be obtained in crude form by extraction of the lyophile-processed organisms with moistened ethyl ether. This fraction can be further purified, and it has been shown that the pure product is homomolecular. A phosphorus-free derivative can be crystallized from water or alcohol as the sodium salt. Both the noncrystalline material and the crystalline material are able to hemolyze red blood cells up to a dilution of 1 in 40,000, and also act as leucocidins. The noncrystalline fraction is stable to oxygen and heat and to acids and alkalis, and appears to be similar to the oxygen-stable hemolysin of Todd (*12*). It does not elicit antibodies when injected into rabbits in the pure form, but is precipitated by antisera prepared against any β-hemolytic streptococci, and can therefore be considered a haptene.

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AGE OF GAINFUL MALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS OF THE UNITED STATES, 1920 AND 1930[1]

Studies on the Age of Gainful Workers No. 2

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INTRODUCTION

The previous paper (*1*) dealt with the age of gainful male and female workers of the United States in different occupational groups for the census years 1920 and 1930. The percentage age distribution for each occupational group, specific for sex and census year, was compared with the percentage age distribution of all gainful workers by forming the ratio of corresponding percentages. This ratio of an observed percentage to its corresponding defined normal or expected percentage showed, among other things, that in many age groups there was considerable variability of the ratios among the different occupational groups, and that the variability was more pronounced for the females than the males. These observations raise the question of whether the behavior of the ratios may be associated with the geographic location of the worker. Two papers of the series, therefore, will attempt to answer this question; the present one will investigate the males, and the one immediately to follow, the females.

The term *gainful worker* includes, according to the Bureau of the Census (*2*), "* * * all persons 10 years old and over who usually follow a gainful occupation even though they may not have been actually employed at the time the census was taken. It does not include women doing housework in their own homes without wages and having no other employment, nor children working at home, merely on general household work, on chores, or at odd times on other work."

For present purposes the 48 States and the District of Columbia have been divided into 4 broad groups, each group constituting a geographic region, as follows: Northeastern (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania); Southern (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas); North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas); and Western (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Nevada, Utah, Washington, Oregon, and California).[2]

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[1] From the Office of Industrial Hygiene and Sanitation, U. S. Public Health Service, Washington, D. C.

[2] The 4 groups of States correspond to the 9 groups used in the publications of the Bureau of the Census, thus: Northeastern = New England + Middle Atlantic; Southern = South Atlantic + East South Central + West South Central; North Central = East North Central + West North Central; and Western = Mountain + Pacific.

The present inquiry, like the previous one, makes use of basic data published by the Bureau of the Census in its reports of 1920 and 1930.

MALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS, BY OCCUPATIONAL GROUP

Table 1 shows for 1920 and 1930 the number of gainful workers in each of the four geographic regions and their distribution among nine groups of occupations. In 1920 the number of workers in the Northeastern, Southern, and North Central regions ranged between 9 and 11 millions, and in the Western region there were approximately 3 millions. In 1930 there were increases as indicated in the table, but the order of the regions remained unchanged. When the various occupational groups are arranged by region, in decreasing order of magnitude with respect to the percentages of workers engaged in the different groups, it will be observed that public service is the only group whose rank is the same for all regions and both census years. The place occupied by this group is last, and the percentages range from 1.7 to 3 percent.

In the following observations based on table 1 the occupational groups giving rise to less than 10 percent in a region will be generally disregarded. In the Northeastern and North Central regions the manufacturing and mechanical industries ranked first in 1920. In the former region those industries claimed almost one-half of the workers, while in the latter the proportion was one-third; in 1930 the situation remained essentially the same, with only small changes in the proportions. In the Southern and Western regions agriculture, forestry, and animal husbandry ranked first with 50 and 29 percent, respectively, the latter percentage approximating that for the manufacturing and mechanical industries of the same region. In 1930 agriculture, forestry, and animal husbandry showed a decrease in the Southern region but continued to rank first; in the Western region there was a small decrease in this occupational group but of sufficient size to cause it and the manufacturing and mechanical industries to interchange places. Thus, it is seen that in all regions, with the exception of the Northeastern, first and second place for both years are always associated with agriculture, forestry, and animal husbandry, and the manufacturing and mechanical industries. In the Northeastern region second place is claimed by trade in 1920 as well as in 1930, with 12 and 16 percent, respectively; in the other regions trade holds third place constantly, varying from 8 percent in the Southern region for 1920 to 15 percent in the Western region for 1930.

TABLE 1.—*Gainful male workers 10 years of age and over in different geographic regions of the United States, specific for occupational group, 1920 and 1930*

Occupational group	1920				1930			
	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
All groups	9,486,076	9,753,727	10,767,489	3,057,445	10,811,523	11,147,292	12,149,579	3,969,410
Agriculture, forestry, animal husbandry	886,732	4,858,853	3,229,606	893,749	807,877	4,912,090	3,102,319	989,913
Extraction of minerals	347,875	321,375	289,632	128,477	318,391	339,078	197,729	128,366
Manufacturing and mechanical industries	4,379,620	2,009,656	3,649,477	849,430	4,528,892	2,473,816	4,133,189	1,088,448
Transportation and communication	940,047	703,227	909,935	297,319	1,131,411	891,127	1,150,247	389,158
Trade	1,174,613	803,215	1,232,080	365,279	1,697,409	1,156,742	1,655,573	609,063
Public service (n. e. c.)[1]	250,606	225,087	182,383	90,590	294,744	216,838	221,344	105,696
Professional service	382,362	247,579	362,693	134,757	583,856	373,485	544,226	226,083
Domestic and personal service	432,295	269,813	363,994	151,866	623,021	416,116	507,818	225,245
Clerical occupations	691,926	314,922	547,599	145,978	825,922	368,000	637,134	207,438
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
All groups	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, animal husbandry	9.3	49.8	30.0	29.2	7.5	44.1	25.5	25.0
Extraction of minerals	3.7	3.3	2.7	4.2	2.9	3.0	1.6	3.2
Manufacturing and mechanical industries	46.2	20.6	33.9	27.8	41.9	22.2	34.0	27.4
Transportation and communication	9.9	7.2	8.4	9.7	10.5	8.0	9.5	9.8
Trade	12.4	8.2	11.4	11.9	15.7	10.4	13.6	15.3
Public service (n. e. c.)[1]	2.6	2.3	1.7	3.0	2.7	1.9	1.8	2.7
Professional service	4.0	2.5	3.4	4.4	5.4	3.4	4.5	5.7
Domestic and personal service	4.6	2.8	3.4	5.0	5.8	3.7	4.2	5.7
Clerical occupations	7.3	3.2	5.1	4.8	7.6	3.3	5.3	5.2

[1] N. e. c.=not elsewhere classified.

Another fact of sufficient importance to which attention should be directed is the size of the difference between the percentages representing first and second place in the various regions (table 1). The differences for both years with respect to the North Central and Western regions are relatively small. In 1920 the Northeastern region showed a percentage for the manufacturing and mechanical industries almost 4 times that for trade; in 1930 the ratio declined to almost 3. The Southern region in 1920, on the other hand, showed the percentage for agriculture, forestry, and animal husbandry to be almost 2.5 times that for the manufacturing and mechanical industries; in 1930 the ratio decreased to 2.

MALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS, BY AGE AND OCCUPATIONAL GROUP

The age distribution of the gainful male workers in the different geographic regions for 1920 and 1930 according to all occupational groups and for particular occupational groups, respectively, is shown in table 2.

Age distribution regardless of occupational group.—When the percentages constituting the age distribution of workers in all occupational groups, specific for region and census year, are arranged in decreasing order of magnitude certain notable facts emerge. Thus, in each region and for both census years, the three ranking age groups are the same and have the same order. These age groups (together with their lower and upper limits irrespective of region and census year) are 25–44 (44 to 51 percent), 45–64 (middle-aged, 24 to 30 percent), and 20–24 (11 to 14 percent), the Southern region for both years showing the smallest percentage of workers in the age groups 25–44 and 45–64 and the largest percentage in the age group 20–24. The remaining age groups, with the exception of the child group (10–17) of the Southern region for both years, have percentages less than 6 percent. In 1920 the Southern child group yielded 9 percent, decreasing in 1930 to 7 percent; the corresponding percentages for the Western region read 3 and 2 percent, respectively, the Northeastern 5 and 3, and the North Central, 4 and 3. It is noteworthy also that in 1920 the old-aged group represents about 4 percent of the workers in each region while in 1930 the corresponding percentage is closer to 5.

Age distribution by occupational group.—It is now pertinent to ask how the different occupational groups rank with respect to the proportion of workers in a particular age group, how the regions compare in this regard, and what the effect is of the passage of 10 years. The questions are asked primarily with respect to the child, middle-, and old-aged groups, respectively, that is, the age groups 10–17, 45–64, and 65 and over.

In 1920, according to table 2, there were from 6 to 12 percent of all clerical workers in the child group, the percentage depending upon the geographic location of the workers. Among the regions the Northeastern ranked first with 12 percent and was followed by the Southern and North Central with 10 percent each and the Western with 6 percent. With the exception of the Southern region, where agriculture, forestry, and animal husbandry claimed 13 percent, no other occupational group furnished a corresponding percentage so large. In 1930 this picture is remarkably different in that the regional percentages of the clerically employed children are much reduced. Thus, while the original order of the regions remains unchanged, the Northeastern shows a reduction from 12 to 7 percent, the Southern and North Central each from 10 to 3 percent, and the Western from 6 to 2 percent. The Northeastern (1930) is the only region whose percentage of child workers in the clerical occupations ranks first among the percentages for the different occupational groups. With respect to the child workers, the passage of 10 years effected a decrease in the regional percentages of all occupational groups with the exception of professional service which showed slight increases in all regions.

In 1920 the clerical workers showed between 15 and 19 percent of their number in the middle-aged group, the specific percentage depending upon the geographic location of the workers. No other occupational group in any region furnished a corresponding percentage so low. The highest percentage among the various occupational groups connected with the middle-aged group of 1920 is associated with different occupational groups depending upon the region. Thus in the Northeastern region the highest percentage (36 percent) was given by agriculture, forestry, and animal husbandry; in the Southern region, professional service (31 percent); in the North Central, public service (35 percent), and in the Western, domestic and personal service (32 percent). A lapse of 10 years changed very little the picture of 1920, as indicated thus far. The clerical occupations continued to rank lowest but with an increase of from 1 to 3 percent, depending upon the region. The highest ranking occupational groups continued to rank highest, with but slight changes in the percentages. The passage of 10 years, however, effected notable increases in extraction of minerals in the Northeastern (23 to 28 percent) and North Central (23 to 34 percent) regions, and in public service in the Southern (21 to 28 percent) and Western (23 to 29 percent) regions.

TABLE 2.—*Age distribution of gainful male workers in different geographic regions of the United States, specific for occupational group, 1920 and 1930*

NORTHEASTERN

Occupational group	Age group, 1920							Age group, 1930						
	10 years old and over	10–17	18–19	20–24	[1] 25–44	45–64	65 and over	10 years old and over	10–17	18–19	20–24	[1] 25–44	45–64	65 and over
	Number	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Number*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
All groups	9,486,076	4.557	4.106	11.881	48.665	26.485	4.306	10,811,523	2.678	4.016	11.922	48.500	28.131	4.753
Agriculture, forestry, animal husbandry	886,732	4.230	3.357	8.365	37.010	35.792	11.246	807,877	4.579	4.332	8.958	33.820	36.081	12.230
Extraction of minerals	347,875	5.957	4.785	11.239	53.180	22.941	1.898	318,391	2.639	4.754	12.380	49.638	28.190	2.399
Manufacturing and mechanical industries	4,379,620	4.810	4.182	11.905	50.033	25.560	3.510	4,528,892	2.485	4.055	11.625	48.693	28.936	4.206
Transportation and communication	940,047	2.311	4.021	14.020	53.043	23.845	2.760	1,131,411	1.468	3.177	13.134	54.064	25.140	3.017
Trade	1,174,613	3.591	3.059	10.510	49.955	28.804	4.081	1,697,409	2.403	3.210	10.559	51.631	27.977	4.220
Public service (n. e. c.)[2]	250,606	1.471	4.776	11.133	42.175	33.019	7.426	294,744	.393	1.892	7.911	45.806	34.752	9.246
Professional service	382,362	.710	1.664	9.989	54.712	28.236	4.680	583,856	1.052	2.067	11.036	53.647	27.441	4.757
Domestic and personal service	432,295	2.295	2.131	8.178	50.927	31.122	5.347	623,021	2.055	3.223	10.054	49.176	29.838	5.654
Clerical occupations	691,926	12.015	8.479	19.607	42.138	15.613	2.148	825,922	6.551	8.747	20.876	44.117	17.169	2.540

SOUTHERN

Occupational group	10 years old and over (1920)	10–17	18–19	20–24	[1] 25–44	45–64	65 and over	10 years old and over (1930)	10–17	18–19	20–24	[1] 25–44	45–64	65 and over
All groups	9,753,727	8.824	5.212	13.724	43.600	23.912	4.728	11,147,292	6.817	5.143	14.236	43.631	25.325	4.848
Agriculture, forestry, animal husbandry	4,858,853	12.919	5.264	12.095	37.895	25.593	6.234	4,912,090	11.546	6.284	13.361	35.031	27.001	6.777
Extraction of minerals	321,375	4.877	6.489	17.908	52.445	16.970	1.311	339,078	2.318	4.802	16.495	55.417	19.721	1.247
Manufacturing and mechanical industries	2,009,656	5.263	5.416	15.475	48.391	22.208	3.247	2,473,816	3.402	4.733	15.441	49.622	23.705	3.097
Transportation and communication	703,227	3.777	5.312	16.750	52.552	19.622	1.987	891,127	2.316	3.995	16.212	54.366	21.228	1.883
Trade	803,215	3.893	3.306	11.531	50.327	27.041	3.902	1,156,742	3.772	3.563	12.006	48.848	27.435	4.376
Public service (n. e. c.)[2]	225,087	1.931	9.611	22.414	41.102	20.732	4.210	216,838	.861	4.029	15.338	45.930	28.397	5.445
Professional service	247,579	.726	1.377	8.745	51.815	31.334	6.003	373,485	1.472	1.897	11.228	49.524	30.162	5.717
Domestic and personal service	269,813	6.362	4.524	13.231	48.312	23.079	4.492	416,116	4.297	4.778	14.531	48.579	23.619	4.196
Clerical occupations	314,922	9.659	6.899	20.364	46.158	14.687	2.233	368,000	3.053	5.102	20.012	51.963	17.516	2.354

[1] Includes a negligible number of persons of unknown age.
[2] N. e. c.=not elsewhere classified.

NORTH CENTRAL

Occupational group	Age group, 1920: 10 years old and over	10–17	18–19	20–24	25–44	45–64	65 and over	Age group, 1930: 10 years old and over	10–17	18–19	20–24	25–44	45–64	65 and over
	Number	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Number*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
All groups	10,767,489	4.043	4.085	12.298	48.499	26.521	4.554	12,149,579	2.500	3.818	12.085	47.673	28.427	5.497
Agriculture, forestry, animal husbandry	3,229,696	4.900	4.341	11.818	43.168	29.418	6.355	3,102,319	4.747	4.933	11.284	38.704	31.615	8.717
Extraction of minerals	289,632	4.023	4.482	11.796	54.054	23.368	2.277	197,729	1.179	3.175	10.399	47.484	34.222	3.541
Manufacturing and mechanical industries	3,649,477	3.615	4.171	12.810	51.482	24.380	3.542	4,133,189	1.455	3.609	12.649	50.954	27.283	4.050
Transportation and communication	909,935	2.367	3.758	12.950	52.549	25.115	3.261	1,150,247	1.351	2.989	12.686	53.342	26.338	3.294
Trade	1,232,080	3.586	2.681	10.001	50.454	29.106	4.172	1,655,573	2.438	2.891	10.298	50.809	28.658	4.906
Public service (n. e. c.)[1]	182,383	1.117	5.230	11.141	39.237	34.915	8.360	221,344	.391	1.573	7.148	44.035	36.642	10.211
Professional service	362,693	.659	1.796	10.017	53.778	28.447	5.303	544,226	.968	2.014	11.271	52.831	27.618	5.298
Domestic and personal service	363,994	2.758	2.347	8.561	49.330	30.729	6.275	507,818	2.002	3.025	9.829	46.706	31.307	7.131
Clerical occupations	547,599	9.739	7.793	20.450	45.023	15.014	1.981	637,134	3.418	6.812	20.613	49.365	17.240	2.552

WESTERN

Occupational group	Age group, 1920: 10 years old and over	10–17	18–19	20–24	25–44	45–64	65 and over	Age group, 1930: 10 years old and over	10–17	18–19	20–24	25–44	45–64	65 and over
All groups	3,057,445	2.923	3.474	10.847	50.549	27.862	4.345	3,969,410	1.815	3.234	11.475	48.083	29.938	5.455
Agriculture, forestry, animal husbandry	893,749	3.608	3.564	10.195	46.084	30.489	6.060	989,913	3.242	4.222	11.290	40.162	32.589	8.495
Extraction of minerals	128,477	1.481	2.757	10.201	55.158	26.553	3.850	128,366	.710	2.315	11.118	52.572	28.869	4.416
Manufacturing and mechanical industries	849,430	2.618	3.671	11.291	51.763	27.081	3.581	1,088,448	1.131	3.147	11.539	49.623	30.109	4.451
Transportation and communication	297,319	2.280	3.677	12.422	55.492	23.765	2.364	389,158	1.133	2.946	12.791	55.050	25.483	2.597
Trade	365,279	3.073	2.382	9.084	52.560	29.118	3.783	609,063	2.183	2.479	9.915	50.792	29.965	4.666
Public service (n. e. c.)[1]	90,590	2.040	8.668	17.948	43.585	23.252	4.507	105,696	.751	3.078	12.689	47.963	28.744	6.775
Professional service	134,757	.633	1.119	7.761	55.784	29.813	4.890	226,083	.777	1.663	9.502	52.231	30.573	5.254
Domestic and personal service	151,866	2.202	1.962	6.915	50.862	32.389	5.670	225,245	1.425	2.584	9.207	45.989	34.167	6.628
Clerical occupations	145,978	6.163	5.241	16.551	50.827	19.034	2.184	207,438	1.564	4.796	18.342	51.821	20.653	2.824

[1] N. e. c.=not elsewhere classified.

With respect to the old-aged group of 1920, agriculture, forestry, and animal husbandry ranked first in the Northeastern (11 percent), Southern (6 percent), and Western (6 percent) regions, and public service ranked first in the North Central (8 percent) with agriculture, forestry, and animal husbandry second (6 percent). The remaining occupational groups regardless of region furnished percentages of 7 percent or less. The middle-aged clerically engaged in each region claimed approximately 2 percent of all clerical workers in a particular region. The situation for 1930 is similar to that for 1920. Attention should, perhaps, be directed to the increases in the North Central and Western regions in agriculture, forestry, and animal husbandry from 6 to 9 percent, and in the latter region the increase in public service from 5 to 7 percent.

RATIO OF OBSERVED PERCENTAGE OF GAINFUL MALE WORKERS IN EACH OCCUPATIONAL GROUP TO THE EXPECTED OR NORMAL PERCENTAGE

The percentage age distribution of all gainful workers, regardless of occupation but specific for region and census year, may be assumed to be the "expected" or "normal" percentage age distribution for each occupational group specific for region and census year. As a consequence of this assumption eight expected or normal age distributions emerge, corresponding to a particular region and census year, and the ratios of the observed percentages to their corresponding expected percentages will disclose whether there is a relatively large, a relatively small, or a normal percentage of workers of a particular occupational group in a specific age group of a particular region and census year.

Reference to the expected or normal percentages has already been made in some detail in the previous section under "Age distribution regardless of occupational group." Table 3 presents the calculated ratios, and figures 1 and 2 show them graphically. The broken line in each figure drawn through 1.00 indicates the normal or expected level of gainful workers; when the percentage of persons actually observed in a particular age and occupational group for a region is the same as the expected percentage, the bar will reach the broken line. Obviously when the height of a bar is below (or above) the normal level, the percentage of persons for the age group and group of occupations represented by the bar is less (or greater) than the percentage expected.

An examination of the matter of normality will throw light on the important question of whether there is, with respect to occupational group, a dearth of workers in the middle-aged and old-aged groups, and an excess in the child group, and how the regions and census years compare in these respects.

Variability of the ratios in the different age groups.—An inspection of figures 1 and 2 reveals that some age groups are more characteristically normal than others and that this normality varies with geographic region and census year. A study of table 3, together with the aid of appropriate graphs of the ratios, shows the age group 25–44 to be least variable, with the group 45–64 immediately following; these observations hold for each region and each year.[3] The order of the age groups, however, is the same for each region in 1930, namely, 25–44, 45–64, 20–24, 18–19, 65 and over, and 10–17; there is no similarity of order in 1920 beyond that previously indicated. The graphs show further that the curves representing the different occupational groups in each region specific for census year cross and recross each other, which makes it impossible to order the regional-specific occupational groups with any definiteness.[4]

Age changes in the ratios; specific occupational groups of different regions compared.—Figure 3 shows graphically how the age changes in the ratios for five different occupational groups compare with respect to the geographic location of the worker; figure 4 shows the same for the four remaining occupational groups. In both figures the points representing the successive ratios have been joined by straight lines to facilitate reading. The figures disclose that, first, the ratios of no occupational group lie consistently above or below the expected normal level of workers; second, the ratios for a specific occupational group for the different regions are in many instances similar for specific age groups; third, the trends of the ratios for 1920 are similar to the trends of the corresponding ratios for 1930, with the exception of public service in the earlier age groups; and finally, and perhaps most important, the regions cannot be placed in a definite order with respect to the ratios of any specific occupational group. The trends of the regional curves will be examined in what is to follow; attention will be directed to exceptional deviations from a trend laid down for a specific occupational group, and to any striking regional differences in specific occupational and age groups.

The figures further disclose that the 18 sets of 4 curves each may be classified into 4 categories depending upon the configuration of the curves as follows: (1) U-shaped, (2) inverted U, (3) ascending, and (4) descending. These four categories will be discussed in the order as given.

[3] The graphs are omitted.

[4] This phenomenon concerning order may also be recognized in figs. 3 and 4.

TABLE 3.—*Ratio, by age and geographic region of the United States, of percentage of gainful male workers in a specified occupational group to the percentage for all groups, 1920 and 1930 (percentages shown in table 2)*

Occupational group	Age group, 1920						Age group, 1930					
	10–17	18–19	20–24	25–44	45–64	65 and over	10–17	18–19	20–24	25–44	45–64	65 and over
NORTHEASTERN												
Agriculture, forestry, animal husbandry	0.93	0.82	0.70	0.76	1.35	2.61	1.71	1.08	0.75	0.70	1.28	2.57
Extraction of minerals	1.31	1.17	.95	1.09	.87	.44	.99	1.18	1.04	1.02	1.00	.50
Manufacturing and mechanical industries	1.06	1.02	1.00	1.03	.97	.82	.93	1.01	.98	1.00	1.03	.88
Transportation and communication	.51	.98	1.18	1.09	.90	.64	.55	.79	1.10	1.11	.89	.63
Trade	.79	.75	.88	1.03	1.09	.95	.90	.80	.89	1.06	.99	.89
Public service (n. e. c.)[1]	.32	1.16	.94	.87	1.25	1.72	.15	.47	.66	.94	1.24	1.95
Professional service	.16	.41	.84	1.12	1.07	1.09	.39	.51	.93	1.11	.98	1.00
Domestic and personal service	.50	.52	.69	1.05	1.18	1.24	.77	.80	.84	1.01	1.06	1.19
Clerical occupations	2.64	2.07	1.65	.87	.59	.50	2.45	2.18	1.75	.91	.61	.53
SOUTHERN												
Agriculture, forestry, animal husbandry	1.46	1.01	0.88	0.87	1.07	1.32	1.69	1.22	0.94	0.80	1.07	1.40
Extraction of minerals	.55	1.25	1.30	1.20	.71	.28	.34	.93	1.16	1.27	.78	.26
Manufacturing and mechanical industries	.60	1.04	1.13	1.11	.93	.69	.50	.92	1.08	1.14	.94	.64
Transportation and communication	.43	1.02	1.22	1.21	.82	.42	.34	.78	1.14	1.25	.84	.39
Trade	.44	.63	.84	1.15	1.13	.83	.55	.69	.84	1.12	1.08	.90
Public service (n. e. c.)[1]	.22	1.84	1.63	.94	.87	.89	.13	.78	1.08	1.05	1.12	1.12
Professional service	.08	.26	.64	1.19	1.31	1.27	.22	.37	.79	1.14	1.19	1.18
Domestic and personal service	.72	.87	.96	1.11	.97	.95	.63	.93	1.02	1.11	.93	.87
Clerical occupations	1.09	1.32	1.48	1.06	.61	.47	.45	.99	1.41	1.19	.69	.49
NORTH CENTRAL												
Agriculture, forestry, animal husbandry	1.21	1.06	0.96	0.89	1.11	1.40	1.90	1.29	0.93	0.81	1.11	1.59
Extraction of materials	1.00	1.10	.96	1.11	.88	.50	.47	.83	.86	1.00	1.20	.64
Manufacturing and mechanical industries	.89	1.02	1.04	1.06	.92	.78	.58	.95	1.05	1.07	.96	.74
Transportation and communication	.59	.92	1.05	1.08	.95	.72	.54	.78	1.05	1.12	.93	.60
Trade	.89	.66	.81	1.04	1.10	.92	.98	.76	.85	1.07	1.01	.89
Public service (n. e. c.)[1]	.28	1.28	.91	.81	1.32	1.84	.16	.41	.59	.92	1.29	1.86
Professional service	.16	.44	.81	1.11	1.07	1.16	.39	.53	.93	1.11	.97	.96
Domestic and personal service	.68	.57	.70	1.02	1.16	1.38	.80	.79	.81	.98	1.10	1.30
Clerical occupations	2.41	1.91	1.66	.93	.57	.44	1.37	1.78	1.71	1.04	.61	.46

WESTERN

Agriculture, forestry, animal husbandry	1.23	1.03	0.94	0.91	1.09	1.39	1.79	1.31	0.98	0.84	1.09	1.56
Extraction of minerals	.51	.79	.94	1.09	.95	.89	.39	.72	.97	1.09	.96	.81
Manufacturing and mechanical industries	.89	1.06	1.04	1.02	.97	.82	.62	.97	1.01	1.03	1.01	.82
Transportation and communication	.78	1.06	1.15	1.10	.85	.54	.62	.91	1.11	1.14	.85	.48
Trade	1.05	.69	.84	1.04	1.05	.87	1.20	.77	.86	1.06	1.00	.86
Public service (n. e. c.)[1]	.70	2.50	1.65	.86	.83	1.04	.41	.95	1.11	1.00	.96	1.24
Professional service	.22	.32	.72	1.10	1.07	1.13	.43	.51	.83	1.09	1.02	.96
Domestic and personal service	.75	.56	.64	1.01	1.16	1.30	.79	.80	.80	.96	1.14	1.22
Clerical occupations	2.11	1.51	1.53	1.01	.68	.50	.84	1.48	1.60	1.08	.69	.52

[1] N. e. c.=not elsewhere classified.

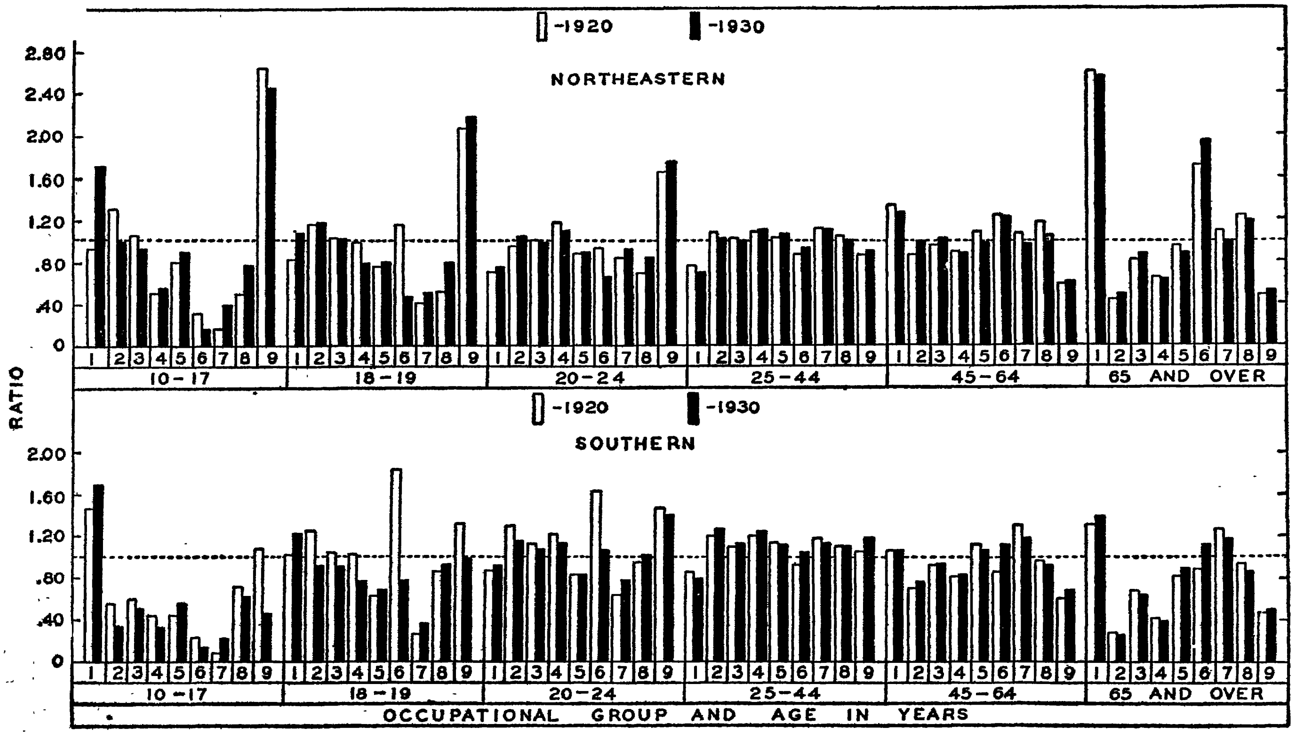

FIGURE 1.—Age-specific ratios of the percentages of gainful male workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1–9 are defined thus: 1, agriculture, forestry, and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

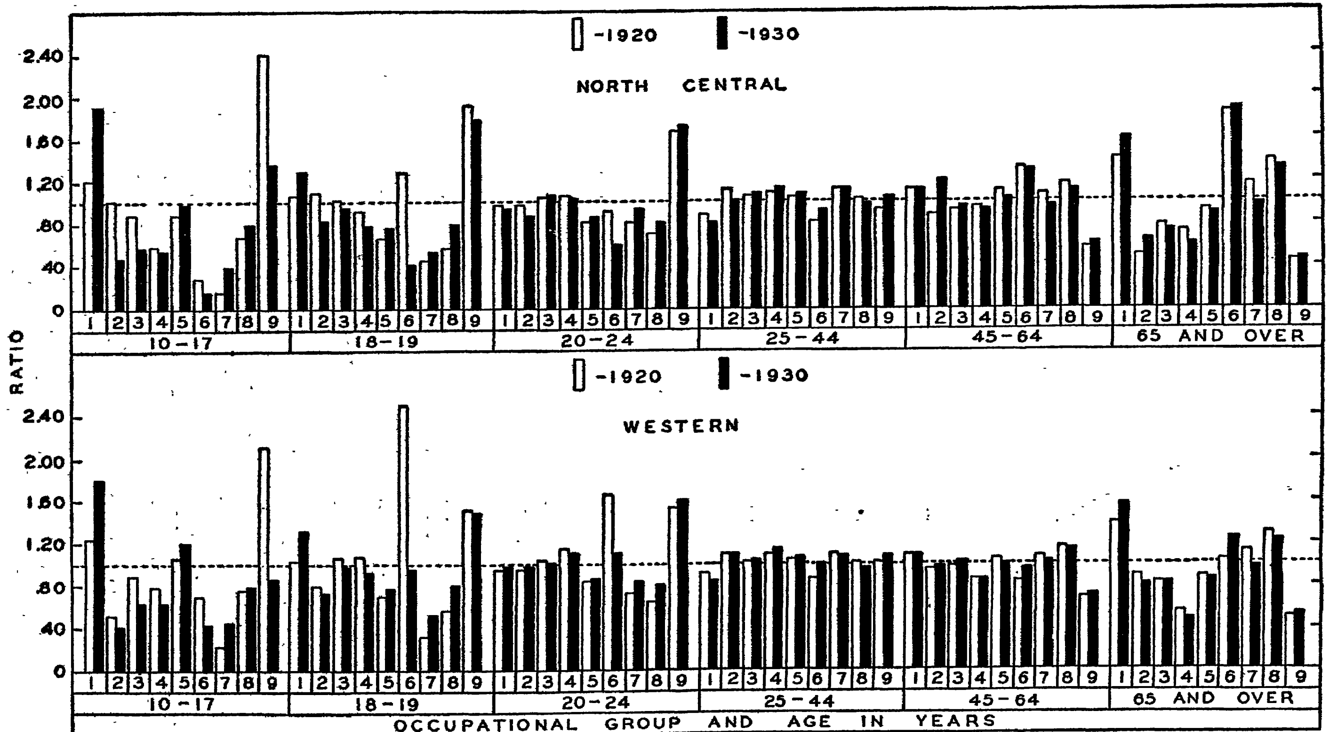

FIGURE 2.—Age-specific ratios of the percentages of gainful male workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry, and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

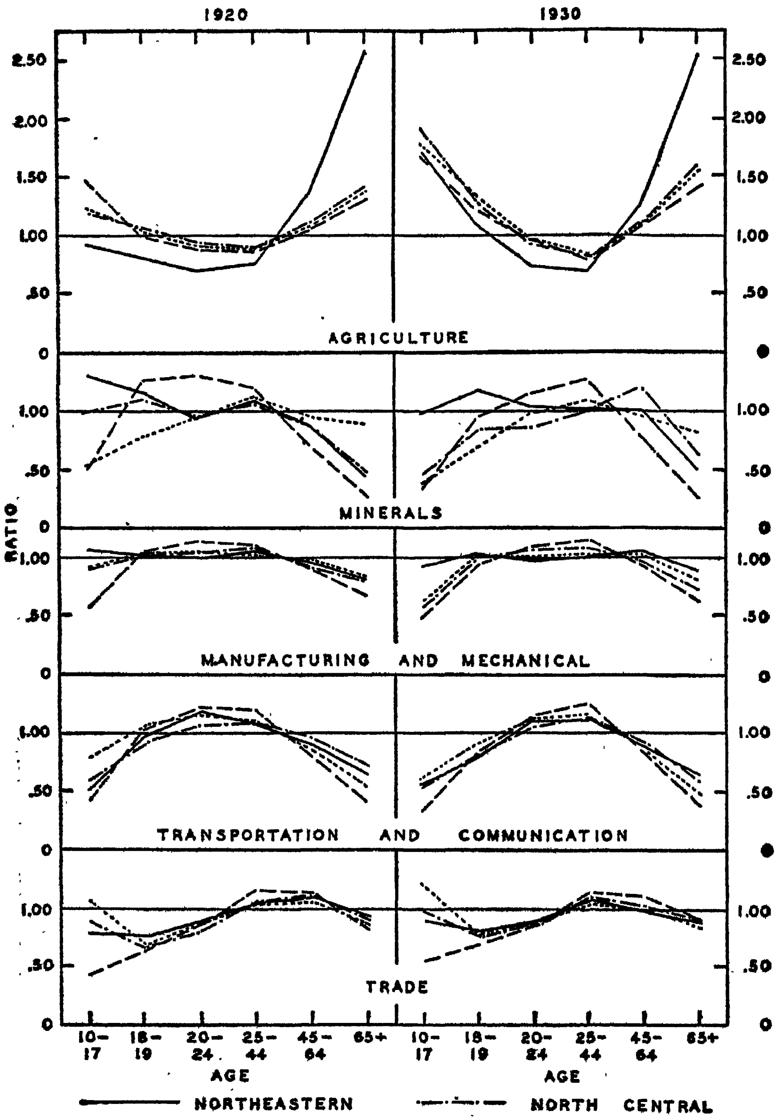

FIGURE 3.—Age-specific ratios of the percentages of gainful male workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (*Agriculture, forestry, and animal husbandry* is abbreviated *agriculture*, while *extraction of minerals* reads *minerals*. Points are joined by straight lines to facilitate reading.)

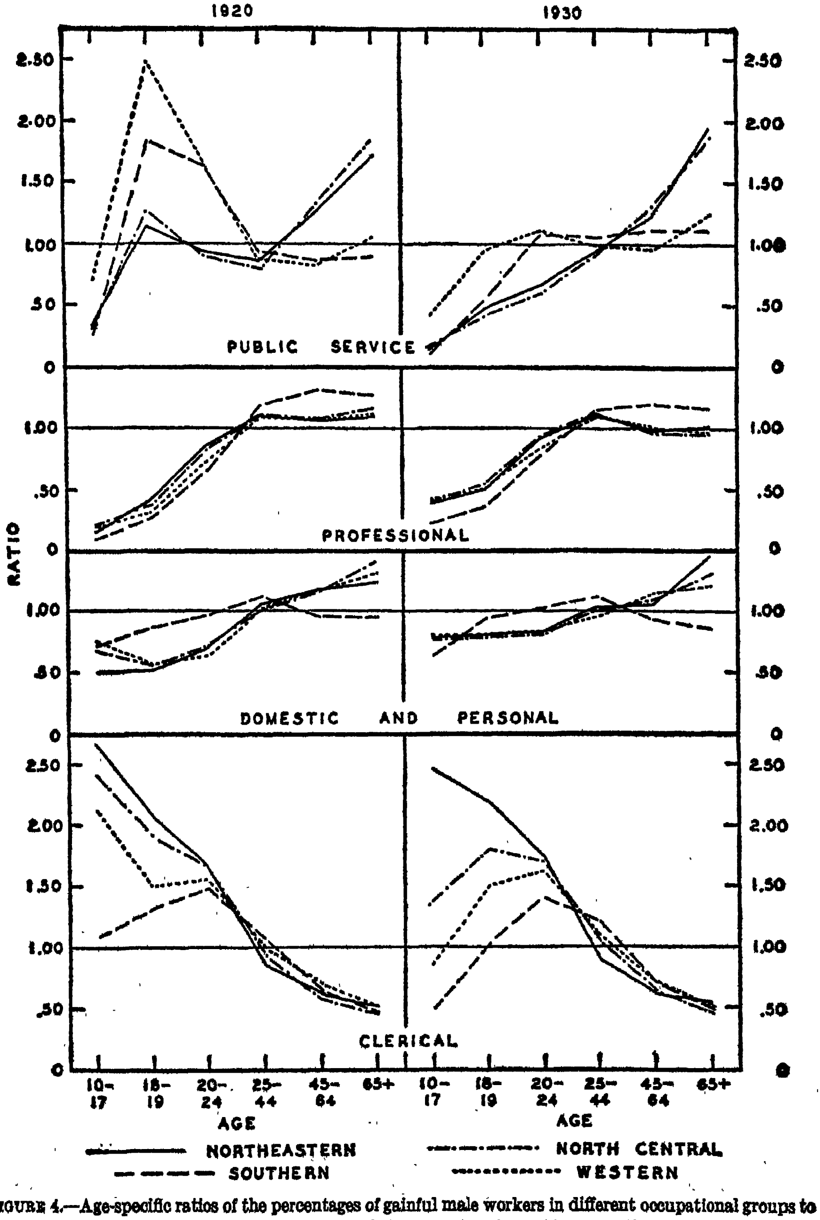

FIGURE 4.—Age-specific ratios of the percentages of gainful male workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (Points are joined to facilitate reading.)

With the U-shaped class, indicating an excess of workers in the early and late ages and a dearth in the intervening ages, is associated only one occupational group, namely, agriculture, forestry, and animal husbandry. It will be observed that the particular type of curve is definitely more pronounced for the year 1930. For both years the Northeastern region behaves differently from the other regions in that it shows in 1920 and 1930 a uniquely high excess of workers in the old-aged group, and in 1920 a subnormal number of child workers. The essential difference between the two sets of curves with respect to census years lies in the two earlier age groups, the ratios for 1920 being generally lower than those for 1930.

The class of curves which has been designated "inverted U" indicates a dearth of workers in the early and later age groups, with an excess in the intervening ages. With this particular class are associated the following four occupational groups with certain possible exceptions as noted: Extraction of minerals (Northeastern region declining in both census years), manufacturing and mechanical industries (Northeastern region declining in 1920), transportation and communication, and trade. The occupations connected with transportation and communication in the different regions approach the ideal inverted U most closely. The curves representing trade show the greatest distortion, the excesses appearing in the later-age groups. Noteworthy also in connection with this occupational group are the relatively high ratios in the child group and the relatively low ones in the two succeeding age groups. In both census years the Western region shows an excess of child workers in trade; the remaining three regions show a subnormal number of children, the Southern region approximating 50 percent, the lowest of the three regional ratios.

The class of curves designated "ascending" indicates that the subnormal number of workers in the earlier ages becomes an excessive number in the old ages. This particular class may be assigned to three occupational groups, with exceptions as indicated: Public service (disturbed by ages 18–24 in 1920, particularly by the large excesses of the Southern and Western regions), professional service, and domestic and personal service. In all regions all of these occupational groups show a subnormal number of child workers and in most instances an excessive number of workers in the old-aged group.

The fourth and last category, defined "descending", indicates a decrease in the number of workers with increase in age. This class may include only the clerical occupations, with the possible exception of the Southern region of 1930, the two earlier age groups causing the curve to assume the form of the inverted U. Up to and including the age group 20–24 the regions appear distinct, and in both census years they may be placed in decreasing order of magnitude as follows:

Northeastern, North Central, Western, and Southern. In 1920 the child group shows great variability among the regions with excessive numbers of workers; in 1930 the unusual variability persists, but there is a consistent drop, two of the regions, Southern and Western, declining below normal. Beyond the age group 20–24 the regions behaved similarly in both years but with no indication of order.

SUMMARY

This paper, the second of a series, investigates the age of gainful male workers in different geographic regions of the United States for the census years 1920 and 1930. The regions include a Northeastern, a Southern, a North Central, and a Western. The percentage age distribution for each occupational group for a particular region and census year is compared with the percentage age distribution of all gainful male workers specific for region and year by forming the ratio of corresponding percentages. The chief observations may be briefly summarized as follows:

1. Regional differences with respect to the number of workers in specific occupational groups were found only in certain age groups. An ordering of the regions with respect to any occupational group is, therefore, not possible.

2. The ratio trends for 1920 are, with a few exceptions, similar to those for 1930.

3. The nine occupational groups generally, regardless of region, may be classified into four categories, depending upon the particular age groups associated with excesses or dearths of workers, thus: (*a*) Agriculture, forestry, and animal husbandry showed an excess of workers in the early and late age groups and a dearth in the intervening groups; (*b*) extraction of minerals, manufacturing and mechanical industries, transportation and communication, and trade showed a dearth in the early and late age groups, with an excess intervening; (*c*) public service, professional service, and domestic and personal service showed a dearth in the earlier age groups that gradually reached an excessive number in the late ages; and (*d*) clerical occupations showed excesses in the early ages that were gradually replaced by a dearth in the older ages.

REFERENCES

(*1*) Gafafer, W. M.: (1937) Age of gainful workers of the United States, 1920 and 1930. Studies on the age of gainful workers no. 1. Pub. Health Rep., 52: 269–281.

(*2*) U. S. Department of Commerce, Bureau of the Census: (1933) Fifteenth Census of the United States, 1930. Population, v. 5, General Report on Occupations. Government Printing Office, Washington, D. C. P. 114.

DEATHS DURING WEEK ENDED MARCH 20, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 20, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9,365	9,852
Average for 3 prior years	9,276	
Total deaths, first 11 weeks of year	114,080	108,198
Deaths under 1 year of age	580	590
Average for 3 prior years	619	
Deaths under 1 year of age, first 11 weeks of year	6,987	6,373
Data from industrial insurance companies:		
Policies in force	69,487,166	68,197,513
Number of death claims	15,230	15,179
Death claims per 1,000 policies in force, annual rate	11.4	11.6
Death claims per 1,000 policies, first 11 weeks of year, annual rate	11.6	11.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 27, 1937, and Mar. 28, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936
New England States:								
Maine	3	--------	13	13	15	216	3	0
New Hampshire	--------	--------	--------	2	47	43	0	1
Vermont	--------	--------	--------	--------	--------	841	0	0
Massachusetts	3	11	--------	--------	782	1,016	4	8
Rhode Island	--------	--------	--------	--------	386	120	0	2
Connecticut	8	4	16	9	573	79	1	3
Middle Atlantic States:								
New York	41	36	[1] 32	[1] 22	838	3,004	14	39
New Jersey	13	16	12	40	2,183	304	5	8
Pennsylvania	30	38	--------	--------	333	1,337	6	10
East North Central States:								
Ohio	16	30	62	242	238	411	4	15
Indiana	12	19	92	55	84	10	4	8
Illinois	33	35	168	52	81	51	5	17
Michigan	11	12	6	22	92	63	3	7
Wisconsin	6	1	103	53	32	88	1	1
West North Central States:								
Minnesota	4	3	3	1	59	394	4	3
Iowa	1	6	2	5	4	1	1	2
Missouri	12	25	192	1,484	27	24	3	9
North Dakota	--------	1	6	9	--------	3	0	2
South Dakota	--------	--------	--------	--------	2	2	0	0
Nebraska	1	8	--------	1	11	64	0	1
Kansas	11	17	11	30	19	13	1	2
South Atlantic States:								
Delaware	--------	2	--------	1	48	49	1	0
Maryland [2]	5	5	28	57	899	204	5	20
District of Columbia	14	14	1	2	114	46	2	10
Virginia	14	16	--------	1,213	379	146	12	10
West Virginia	5	13	165	184	19	52	7	9
North Carolina	12	18	191	169	134	83	5	9
South Carolina [3]	3	5	812	533	32	23	0	16
Georgia [3]	10	16	654	585	--------	--------	1	10
Florida	5	3	19	84	8	8	5	8
East South Central States:								
Kentucky	8	--------	79	167	151	105	29	47
Tennessee	13	4	184	549	24	41	7	17
Alabama [3]	12	5	1,330	1,750	8	18	14	3
Mississippi [3]	2	4	--------	--------	--------	--------	0	5
West South Central States:								
Arkansas	5	12	349	953	1	15	8	5
Louisiana	19	9	132	279	7	90	0	3
Oklahoma [4]	8	2	168	201	48	10	2	5
Texas [3]	43	38	1,166	436	518	440	9	24

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 27, 1937, and Mar. 28, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936
Mountain States:								
Montana	1	5	40	22	60	9	0	1
Idaho			2	11	25	10	0	1
Wyoming		2		58		21	0	2
Colorado	3	10			5	24	0	0
New Mexico	1			43	54	87	2	4
Arizona		2	64	202	265	121	2	0
Utah [2]			1		20	13	0	0
Pacific States:								
Washnigton	1	1	2	9	28	293	4	0
Oregon [5]		2	33	159	9	416	3	1
California	20	23	221	1,768	97	2,597	4	6
Total	404	473	6,359	11,475	8,759	13,005	176	354
First 12 weeks of year	6,360	7,282	250,891	97,288	70,681	101,648	2,019	2,864

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936
New England States:								
Maine	0	0	34	25	0	0	2	2
New Hampshire	0	0	29	3	0	0	0	0
Vermont	0	0	10	49	0	0	0	0
Massachusetts	0	0	269	299	0	0	2	1
Rhode Island	0	0	60	29	0	0	1	0
Connecticut	0	0	167	102	0	0	1	1
Middle Atlantic States:								
New York	0	0	1,056	1,116	0	0	14	10
New Jersey	1	0	155	541	0	0	1	1
Pennsylvania	2	1	623	571	0	0	4	12
East North Central States:								
Ohio	4	1	339	440	3	0	2	71
Indiana	0	0	268	298	8	10	0	0
Illinois	3	0	779	931	63	14	3	11
Michigan	0	0	891	397	20	1	2	5
Wisconsin	0	0	432	574	1	6	8	0
West North Central States:								
Minnesota	0	0	160	463	13	13	1	2
Iowa	1	0	327	209	33	17	1	0
Missouri	0	0	360	193	68	16	2	0
North Dakota	0	0	33	75	15	7	0	0
South Dakota	0	0	59	38	0	21	2	0
Nebraska	0	1	95	241	14	35	0	0
Kansas	0	0	415	314	23	30	1	1
South Atlantic States:								
Delaware	0	0	2	3	0	0	0	0
Maryland [2]	0	0	35	99	0	0	6	4
District of Columbia	0	0	14	21	0	0	0	0
Virginia	0	0	30	60	1	0	5	4
West Virginia	0	0	40	44	0	0	3	4
North Carolina	0	3	39	20	0	1	2	5
South Carolina [3]	1	0	5	6	0	0	2	1
Georgia [3]	1	0	21	14	0	1	1	2
Florida	0	0	8	10	0	0	2	1
East South Central States:								
Kentucky	1	0	36	54	0	0	4	0
Tennessee	0	0	25	52	0	1	2	1
Alabama [3]	2	0	16	10	0	0	2	2
Mississippi [3]	0	0	5	15	0	0	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 27, 1937, and Mar. 28, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936	Week ended Mar. 27, 1937	Week ended Mar. 28, 1936
West South Central States:								
Arkansas	0	0	23	19	1	1	0	1
Louisiana	0	0	4	22	5	1	5	2
Oklahoma [4]	1	0	19	24	0	1	0	2
Texas [3]	1	3	83	75	7	2	9	6
Mountain States:								
Montana	0	0	36	129	37	5	0	2
Idaho	0	0	37	118	1	7	0	0
Wyoming	0	1	16	88	2	2	0	0
Colorado	0	0	46	103	3	1	0	0
New Mexico	0	0	30	65	2	1	0	0
Arizona	0	0	18	12	0	0	1	3
Utah [2]	0	0	12	87	0	4	0	0
Pacific States:								
Washington	1	1	32	100	6	19	0	2
Oregon [5]	1	0	31	43	23	1	2	6
California	0	3	186	343	8	1	1	3
Total	20	14	7,410	8,544	357	219	95	168
First 12 weeks of year	259	216	80,773	95,213	3,654	2,664	1,308	1,228

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 27, 1937, 32 cases, as follows: South Carolina, 4; Georgia, 15; Alabama, 5; Texas, 8.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Mar. 27, 1937, Oregon, 1 case.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1936										
Massachusetts	12	18		2	2,006	1		753	0	5
Puerto Rico		43	44	1,055	99		1			191
January 1937										
Massachusetts	13	20			4,024		1	992	0	8
Puerto Rico		42	111	963	147	1	1		0	170
February 1937										
Arizona	11	16	2,971	1	942	2	0	101	0	1
Hawaii Territory		14	24		1,317		3		0	3
Kansas	6	32	2,944	1	22	1		1,400	94	3
Louisiana	4	47	1,291	23	16		2	37	0	22
Massachusetts	15	21		1	3,503	2	1	1,002	0	3
Montana	4	15	1,692		81		0	248	86	2
Nevada			71		6		0	48	2	0
North Dakota	4	4	79		8		1	174	67	0
Oregon	2	3	2,044	1	32		2	145	89	4
Rhode Island	4	3	85		866		0	271	0	2
Tennessee	25	68	3,151	13	227	7	1	92	1	23
Texas	39	197	15,929	539	1,483	101	9	397	15	41
Washington	7	17	191		159		0	167	22	6

Summary of monthly reports from States—Continued

December 1936

	Cases
Massachusetts:	
Anthrax	2
Chicken pox	1,393
Dysentary (amoebic)	1
Encephalitis, epidemic or lethargic	3
German measles	63
Mumps	663
Ophthalmia neonatorum	96
Paratyphoid fever	1
Rabies in animals	13
Septic sore throat	6
Tetanus	1
Trachoma	1
Undulant fever	3
Whooping cough	1,738
Puerto Rico:	
Chicken pox	7
Dysentary	11
Filariasis	1
Leprosy	1
Mumps	17
Opthalmia neonatorum	2
Puerperal septicemia	7
Tetanus	18
Tetanus, infantile	1
Whooping cough	25

January 1937

	Cases
Massachusetts:	
Chicken pox	1,772
Dysentary (amoebic)	1
Encephalitis, epidemic or lethargic	3
German measles	76
Mumps	719
Ophthalmia neonatorum	69
Rabies in animals	17
Septic sore throat	14
Trachoma	1
Undulant fever	5
Whooping cough	2,167
Puerto Rico:	
Chicken pox	32
Dysentery	17
Leprosy	1
Mumps	7
Ophthalmia neonatorum	3
Puerperal septicemia	1
Tetanus	4
Tetanus, infantile	3
Whooping cough	42

February 1937

	Cases
Chicken pox:	
Arizona	108
Hawaii Territory	152
Kansas	444
Louisiana	15
Massachusetts	1,438
Montana	142
Nevada	1
North Dakota	85
Oregon	149
Rhode Island	215
Tennessee	222
Texas	774
Washington	624
Dengue:	
Texas	62
Dysentery:	
Arizona	2
Hawaii Territory (amoebic)	2
Louisiana (amoebic)	8
Massachusetts (bacillary)	4
Rhode Island (bacillary)	1
Tennessee (bacillary)	6
Texas (amoebic)	2
Texas (bacillary)	27
Washington (bacillary)	1
Encephalitis, epidemic or lethargic:	
Arizona	1
Kansas	2
Louisiana	1
Massachusetts	5
Tennessee	1
Texas	4
Washington	2
German measles:	
Arizona	9
Kansas	14
Massachusetts	77
Montana	3
Rhode Island	42
Tennessee	52
Washington	10
Hookworm disease:	
Hawaii Territory	6
Louisiana	10
Impetigo contagiosa:	
Kansas	9
Oregon	46
Tennessee	4
Washington	3
Jaundice, infectious:	
Hawaii Territory	4
Oregon	4
Lead poisoning:	
Massachusetts	2
Leprosy:	
Hawaii Territory	4
Mumps:	
Arizona	112
Hawaii Territory	92
Kansas	1,008
Louisiana	21
Massachusetts	736
Montana	456
North Dakota	152
Oregon	101
Rhode Island	16
Tennessee	111
Texas	1,462
Washington	390
Ophthalmia neonatorum:	
Hawaii Territory	2
Massachusetts	81
Paratyphoid fever:	
Hawaii Territory	1
Massachusetts	2
Texas	2
Puerperal septicemia:	
Washington	1
Rabies in animals:	
Louisiana	25
Massachusetts	26
Texas	11
Washington	20
Scabies:	
Oregon	70
Septic sore throat:	
Kansas	2
Louisiana	1
Massachusetts	44
Montana	17
Oregon	13
Rhode Island	3
Tennessee	4
Tetanus:	
Tennessee	2
Washington	1
Trachoma:	
Arizona	20
Massachusetts	4
Montana	1
Oregon	2
Tennessee	47
Tularaemia:	
Kansas	1
Louisiana	10
Tennessee	5
Texas	2
Typhus fever:	
Texas	3
Undulant fever:	
Kansas	4
Louisiana	5
Massachusetts	1
Texas	4
Washington	1
Vincent's infection:	
Kansas	2
North Dakota	2
Oregon	5
Tennessee	4
Washington	1
Whooping cough:	
Arizona	29
Hawaii Territory	11
Kansas	187
Louisiana	48
Massachusetts	1,832
Montana	28
Nevada	2
North Dakota	15
Oregon	116
Rhode Island	74
Tennessee	166
Texas	508
Washington	108

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 20, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	238	656	137	7,099	988	2,724	22	423	22	1,481	--------
Current week [1]	168	559	104	3,255	943	2,769	69	417	21	1,456	--------
Maine:											
Portland	0	------	0	1	4	5	0	1	0	1	29
New Hampshire:											
Concord	0	------	2	0	0	0	0	1	0	0	7
Manchester	0	------	5	0	1	2	0	0	0	0	27
Nashua	0	------	--------	0	-------	0	0	-------	0	0	--------
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	1	0
Burlington	0	------	0	0	0	2	0	0	0	0	4
Rutland	0	------	0	1	0	0	0	0	0	2	5
Massachusetts:											
Boston	0	------	0	10	36	78	0	11	1	111	243
Fall River	0	------	0	22	5	3	0	1	0	2	33
Springfield	0	------	0	9	4	9	0	0	0	3	37
Worcester	0	------	0	145	3	8	0	1	1	28	69
Rhode Island:											
Pawtucket	0	------	0	16	0	2	0	0	0	0	12
Providence	1	------	0	341	6	44	0	1	0	36	59
Connecticut:											
Bridgeport	0	1	1	15	2	62	0	1	0	1	32
Hartford	0	2	0	0	8	5	0	0	0	3	36
New Haven	0	------	0	0	1	8	0	1	0	0	29
New York:											
Buffalo	------	------	--------	------	-------	------	------	-------	------	------	--------
New York	54	47	7	253	187	485	0	98	2	59	1,655
Rochester	0	4	0	0	10	3	0	2	0	22	77
Syracuse	0	------	0	6	2	71	0	0	0	53	57
New Jersey:											
Camden	0	2	1	0	1	6	0	0	0	4	45
Newark	0	2	2	951	15	25	0	1	0	13	133
Trenton	0	------	0	2	7	10	0	4	0	1	51
Pennsylvania:											
Philadelphia	3	6	4	23	60	239	0	26	1	84	559
Pittsburgh	1	3	2	52	35	54	0	9	0	37	216
Reading	0	------	1	8	1	9	0	0	0	7	33
Scranton	0	------	--------	0	-------	28	0	-------	0	0	--------
Ohio:											
Cincinnati	5	------	2	93	19	10	0	17	0	14	172
Cleveland	3	26	1	61	33	65	0	17	0	44	242
Columbus	2	1	1	1	9	4	0	6	0	15	91
Toledo	1	------	0	72	1	12	0	6	0	38	65
Indiana:											
Anderson	0	------	0	1	2	21	0	1	0	1	12
Fort Wayne	1	------	0	0	2	0	0	0	0	8	26
Indianapolis	0	------	0	83	19	53	1	4	0	48	120
South Bend	0	------	0	1	4	8	0	1	0	5	16
Terre Haute	4	------	0	0	0	0	0	0	0	0	19
Illinois:											
Alton	0	------	0	0	1	12	0	0	0	0	8
Chicago	17	19	7	42	54	300	0	43	2	49	757
Elgin	1	------	0	0	1	0	0	0	0	3	10
Moline	0	------	0	0	5	0	0	0	0	10	12
Springfield	0	------	0	0	5	15	0	0	0	3	33
Michigan:											
Detroit	9	5	5	7	36	477	0	17	3	85	282
Flint	1	------	0	0	6	29	0	1	0	5	30
Grand Rapids	1	------	0	25	2	12	0	0	0	28	37
Wisconsin:											
Kenosha	0	------	0	1	0	4	0	0	0	0	9
Madison	0	------	0	0	0	2	0	1	0	3	19
Milwaukee	0	1	1	6	15	82	0	6	0	21	117
Racine	0	------	0	1	0	9	0	0	0	0	13
Superior	0	------	0	0	0	0	0	0	0	11	6

[1] Figures for Buffalo and Raleigh estimated; current reports not received.

City reports for week ended Mar. 20, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota:											
Duluth	0	------	0	1	5	22	0	1	0	3	25
Minneapolis	0	------	1	1	9	23	0	4	0	42	108
St. Paul	0	1	1	1	4	7	0	2	0	86	59
Iowa:											
Cedar Rapids	0	------	------	1	------	2	0	------	0	0	------
Davenport	0	------	------	0	------	3	0	------	0	2	------
Sioux City	0	------	------	0	------	22	1	------	1	0	------
Waterloo	0	------	------	1	------	15	0	------	0	20	------
Missouri:											
Kansas City	1	2	1	0	18	100	0	0	0	10	109
St. Joseph	0	------	0	1	6	20	49	3	0	1	39
St. Louis	8	3	1	2	12	86	2	10	0	108	261
North Dakota:											
Fargo	0	------	0	0	1	8	0	0	0	0	7
Grand Forks	0	------	------	0	------	0	1	------	0	2	------
Minot	0	------	0	0	0	0	0	0	0	0	9
South Dakota:											
Aberdeen	0	------	------	0	------	7	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	8
Nebraska:											
Omaha	1	------	1	1	11	8	1	1	0	4	61
Kansas:											
Lawrence	0	------	0	0	1	0	0	0	0	3	3
Topeka	0	------	1	0	2	10	0	0	0	0	13
Wichita	2	1	1	2	1	8	9	0	1	9	23
Delaware:											
Wilmington	0	------	0	8	1	1	0	1	0	1	29
Maryland:											
Baltimore	3	12	2	757	29	23	0	11	1	73	265
Cumberland	0	------	0	0	1	0	0	0	0	1	8
Frederick	0	1	0	7	1	0	0	0	0	0	6
District of Columbia:											
Washington	8	2	1	59	29	17	0	13	1	9	195
Virginia:											
Lynchburg	0	------	2	1	5	0	0	0	0	3	16
Norfolk	0	------	0	0	6	1	0	4	0	1	37
Richmond	2	------	3	0	7	3	0	1	0	2	50
Roanoke	0	------	0	51	4	0	0	0	0	1	15
West Virginia:											
Charleston	1	------	0	0	8	2	0	2	0	4	28
Huntington	0	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	0	0	2	5	0	0	0	1	22
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	1	------
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	1	0	0	1	2	0	2	0	1	14
Winston-Salem	0	17	0	0	2	7	0	2	0	2	21
South Carolina:											
Charleston	0	158	5	0	5	3	0	0	0	0	30
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	0	0	2	0	0	0	0	0	10
Greenville	0	------	0	0	4	0	0	2	0	0	29
Georgia:											
Atlanta	0	54	3	0	11	3	0	2	0	2	73
Brunswick	0	------	0	0	0	0	0	0	0	0	3
Savannah	1	81	1	0	1	1	0	2	0	1	30
Florida:											
Miami	3	------	3	2	6	0	0	1	0	0	48
Tampa	1	------	0	0	7	1	0	0	0	3	30
Kentucky:											
Ashland	1	3	0	0	3	1	0	1	0	0	9
Covington	0	------	0	5	5	2	0	2	0	0	30
Lexington	0	15	0	7	5	0	0	2	0	7	26
Louisville	1	------	1	2	12	10	0	8	0	22	79
Tennessee:											
Knoxville	0	5	2	3	7	0	0	1	0	0	23
Memphis	1	------	3	0	15	7	0	4	1	26	93
Nashville	3	------	2	0	1	4	0	6	0	0	54
Alabama:											
Birmingham	0	55	8	0	14	4	0	2	0	5	96
Mobile	1	------	5	0	4	2	0	1	0	1	26
Montgomery	0	7	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	1	0	------	0	0	------
Little Rock	0	------	1	0	7	8	0	2	0	0	10

City reports for week ended Mar. 20, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Louisiana:											
Lake Charles	0		0	0	1	0	0	0	0	0	
New Orleans	11	10	7	0	20	7	0	10	1	0	178
Shreveport	3		1	1	10	1	0	0	1	9	56
Oklahoma:											
Oklahoma City	1	12	1	0	11	6	0	1	0	0	47
Tulsa	1			1		3	0		0	3	
Texas:											
Dallas	4	5	2	76	10	16	0	5	0	10	69
Fort Worth	0		0	33	4	6	0	1	0	6	33
Galveston	0		0	0	0	2	0	0	0	0	15
Houston	2	5	1	1	13	4	1	5	1	6	95
San Antonio	1		4	23	3	1	0	3	0	4	68
Montana:											
Billings	0		0	0	1	1	0	0	0	0	9
Great Falls	0		0	0	1	1	0	0	0	2	5
Helena	0		0	15	0	5	0	0	0	0	2
Missoula	0		0	0	1	0	2	0	0	0	10
Idaho:											
Boise	0		0	0	0	1	0	1	0	0	5
Colorado:											
Colorado Springs	0		0	1	1	8	0	1	0	0	11
Denver	3		1	2	5	14	1	4	1	52	91
Pueblo	0		0	0	1	3	0	0	0	0	[illegible]
New Mexico:											
Albuquerque	0		0	0	0	5	0	4	0	9	11
Utah:											
Salt Lake City	0		0	20	0	18	0	0	0	11	20
Washington:											
Seattle	0		0	14	6	4	0	6	0	23	108
Spokane	0		0	0	1	6	0	1	0	9	36
Tacoma	0		0	0	1	4	0	0	0	0	32
Oregon:											
Portland	0		3	2	11	11	6	3	0	3	96
Salem	0	1		0		0	0		0	1	
California:											
Los Angeles	8	18	5	26	30	50	3	23	1	75	354
Sacramento	2	6	0	3	6	9	0	1	0	0	36
San Francisco	4	4	2	0	10	24	0	11	2	15	162

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
New York:			
New York	9	2	0
New Jersey:			
Newark	2	0	0
Pennsylvania:			
Philadelphia	1	0	0
Ohio:			
Cincinnati	0	1	0
Cleveland	1	1	0
Indiana:			
Indianapolis	1	1	0
Illinois:			
Chicago	4	2	0
Wisconsin:			
Milwaukee	1	0	0
Missouri:			
St. Joseph	1	0	0
Maryland:			
Baltimore	4	2	0
District of Columbia:			
Washington	3	1	0
West Virginia:			
Wheeling	1	0	0
South Carolina:			
Charleston	1	0	0
Georgia:			
Atlanta	1	2	0
Florida:			
Miami	2	0	0
Tampa	1	1	0
Tennessee:			
Knoxville	3	0	0
Memphis	1	2	0
Alabama:			
Birmingham	9	4	0
Louisiana:			
New Orleans	5	0	0
Shreveport	0	3	0
Texas:			
Houston	1	0	0
San Antonio	3	1	0
Colorado:			
Denver	1	0	0
Washington:			
Spokane	2	0	0
Oregon:			
Portland	1	0	0
California:			
Los Angeles	1	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Philadelphia, 1; Pittsburgh, 1; Columbus, San Francisco, 1.

Pellagra.—Cases: Atlanta, 1; Savannah, 5; Nashville, 1; Birmingham, 1; Los Angeles, 2.

Typhus fever.—Cases: New York, 1; Gastonia, 1; Miami, 1; Birmingham, 1; Montgomery, 3.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—4 weeks ended March 13, 1937.—During the 4 weeks ended March 13, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	25		Tuberculosis	13	1
Malaria	[1] 30		Typhoid fever	[1] 48	5
Scarlet fever	1				

[1] Includes imported cases.

FINLAND

Communicable diseases—February 1937.—During the month of February 1937, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	310	Scarlet fever	1,165
Dysentery	2	Smallpox	1
Influenza	4,606	Typhoid fever	22
Paratyphoid fever	3		

GREAT BRITAIN

England and Wales—Infectious diseases—14 weeks ended January 2, 1937.—During the 14 weeks ended January 2, 1937, certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Diphtheria	18,248	Puerperal pyrexia	1,579
Ophthalmia neonatorum	1,097	Scarlet fever	29,304
Pneumonia	11,095	Smallpox	8
Puerperal fever	525	Typhoid fever	405

England and Wales—Vital statistics—Fourth quarter, 1936.—During the quarter ended December 31, 1936, 144,077 live births and 122,717 deaths were registered in England and Wales. The following vital statistics are taken from the Quarterly Return of Births, Deaths, and

Marriages, issued by the Registrar General of England and Wales, and are provisional:

Birth and death rates in England and Wales, quarter ended Dec. 31, 1936

Annual rates per 1,000 population:	
Live births	14.00
Stillbirths	.59
Deaths, all causes	12.00
Deaths under 1 year of age	[1] 56.00
Deaths from:	
Diarrhea and enteritis (under 2 years of age)	[1] 7.00
Diphtheria	.08
Annual rates per 1,000 population—Continued.	
Deaths from—Continued	
Influenza	0.14
Measles	.01
Scarlet fever	.01
Typhoid fever and paratyphoid fever	.00
Violence	.55
Whooping cough	.03

[1] Per 1,000 live births.

YUGOSLAVIA

Communicable diseases—February 1937.—During the month of February 1937, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	21	1	Paratyphoid fever	7	2
Cerebrospinal meningitis	56	17	Poliomyelitis	2	1
Diphtheria and croup	765	78	Scarlet fever	347	3
Dysentery	23	1	Sepsis	13	4
Encephalitis	2		Tetanus	17	8
Erysipelas	237	14	Typhoid fever	173	29
Influenza	1,879	25	Typhus fever	125	5
Measles	1,485	6			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar. 26, 1937, pp. 372–385. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr. 30, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Plague on vessel.—A case of plague was reported March 27, 1937, on the British S. S. *Magister* while under quarantine at Kingston, Jamaica. The diagnosis was confirmed bacteriologically on April 3. The vessel was fumigated, and appropriate precautionary measures were taken.

The *Magister* arrived at Kingston from the Brazilian ports of Maranhao, Para, and Manaos, and had touched previously at St. Lucia, Natal, Ceara, Parnahyba, Kingston (Jan. 1), and Port Arthur (Tex.), (Dec. 24, 1936).

Smallpox

Gambia—Bathurst.—On March 11, 1937, 4 cases of smallpox imported from MacCarthy's Island were reported in Bathurst, Gambia.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Matto Grosso State: Maracaju, January 29 to February 11, 1937, 8 cases, 1 death; Ponto Pora, February 17, 1937, 1 death. Minas

Geraes State: Alfena, February 10–17, 1937, 2 deaths; Areiado, February 12, 1937, 1 death; Campos Geraes, February 20–25, 1937, 4 deaths; Lavras, February 20, 1937, 1 death; Sao Paulo State, Ribeirao Preto, February 26, 1937, 1 death.

Gold Coast—Teshi.—On March 16, 1937, 1 case of yellow fever was reported in Teshi, Gold Coast.

Ivory Coast—Agboville.—On March 18, 1937, 1 case of yellow fever was reported in Agboville, Ivory Coast.

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THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 52 APRIL 16, 1937 NO. 16

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

February 28–March 27, 1937

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS, under the section entitled "Prevalence of Disease."

Influenza.—Data showing the progress of the minor outbreak of influenza which reached its peak in the various sections of the country during the months of January and February have been published every 4 weeks in the PUBLIC HEALTH REPORTS (see footnote 1 to table 1). During the month of March both reported cases of and deaths from influenza and pneumonia have decreased in every section. Table 1 shows for the 4 weeks of March the number of reported cases, the mortality rates for influenza and pneumonia, and mortality rates for all causes for all sections combined. There has been an excess in the number of reported cases of influenza as compared with the corresponding weeks of 1934—12,000 excess cases for the week ended March 6 and 4,000 for the week ended March 27. The slight excess in mortality from influenza and pneumonia during March is due to the higher rates in the South Atlantic, East South Central, and West South Central areas. For the week ended March 20, the last week for which mortality data are available, there is still a slight excess in the latter two areas. Mortality from all causes was about the seasonal expectancy during March.

[1] From the Office of Statistical Investigations, U. S. Public Health Service. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 46; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

TABLE 1.—*Number of cases of influenza and death rates from influenza and pneumonia and from all causes in each geographic area, by weeks, from Feb. 28 to Mar. 27, 1937* [1]

Region	Week ended—											
	Mar. 6	Mar. 13	Mar. 20	Mar. 27	Feb. 27	Mar. 6	Mar. 13	Mar. 20	Mar. 6	Mar. 13	Mar. 20	Mar. 27
	Number of reported cases in States				Death rate (annual basis) from influenza and pneumonia in 95 large cities, per 100,000 population				Death rate (annual basis) from all causes in 86 large cities per 1,000 population			
All regions:[2]												
1937 [2]	15,134	11,131	8,852	6,359	224	197	190	166	13.3	13.2	13.0	12.9
1934 [3]	8,341	2,971	2,754	2,193	171	175	173	153	13.0	13.4	12.7	12.7

[1] For similar tables see PUBLIC HEALTH REPORTS for Jan. 15, 1937, p. 68; Jan. 29, p. 126; Feb. 12, p. 190; Feb. 19, p. 210; and Mar. 19, p. 327.

[2] No reports were received from Mississippi, Nevada, up-State New York, Pennsylvania, and Virginia. New York City is included.

[3] Reported cases for the corresponding weeks of 1934, the winter of 1933-34 being one of average influenza incidence.

Meningococcus meningitis.—For the 4 weeks ended March 27, 772 cases of meningococcus meningitis were reported. Although this number was about 65 percent of that for the corresponding period in 1936, it was approximately 20 percent in excess of the incidence in 1935. Since the beginning of 1935 this disease has been unusually prevalent. In 1934, 1933, and 1932 the numbers of cases for this period were 225, 393, and 296, respectively.

The high incidence has prevailed in all sections of the country. During the current period, however, practically every section reported fewer cases than during the comparable period of the preceding year, and in all regions, except the South Atlantic and South Central, the incidence had dropped to the average level of the years 1932–34, inclusive. In those regions the incidence was below that of last year, but it was still somewhat above the normal expectancy. These same areas reported a high incidence during this period in 1936. In the South Atlantic region, Virginia, West Virginia, and Florida reported 46, 32, and 25 cases, respectively, and in the South Central regions, Kentucky reported 86 cases, Alabama, 55, and Texas, 41. These figures are considerably above the average for these States for this period for the years 1932–34. Several regions reported decreases from the figures for the preceding 4-week period, but as the peak of this disease for the country as a whole has usually been reached during April, a still higher level is probably in prospect. In 1929 the total number of cases for this period was 1,257, with a gradual decline to 225 for the corresponding 4 weeks in 1934—a period of 6 years. It is possible that the year 1936, with a total of 1,172 cases for this period, may be the peak year of another high incidence of this disease during these 4 weeks.

Measles.—The current incidence of measles is the lowest in recent years, with 32,967 cases reported, or about 75 percent of last year's figure for the corresponding period. The only region showing an excess over 1936 is the South Atlantic, where the number of cases (5,469) was about 2.5 times that of last year. The incidence in the North Atlantic regions closely approximated that of last year, but in all other regions the disease was considerably less prevalent. In 1935 and 1934 the numbers of cases reported for the country as a whole during this period were approximately 132,000 and 129,000, respectively, while the average for recent years with a normal incidence of measles is about 55,000 cases.

Scarlet fever.—At the present time scarlet fever is less prevalent than during the corresponding period in each of the 2 preceding years. The number of cases (30,157), however, was somewhat above the average for this period in recent years. In 1936 and 1935 approximately 35,000 and 32,000 cases, respectively, were reported, while the average for the years 1929–34, inclusive, was about 25,000 cases. The North Central regions continued to report a large number of cases; in the West North Central region the number of cases (5,961) was the highest for this period in the 9 years for which these data are available. The South Atlantic region reported the smallest number of cases in recent years, and in other regions the incidence stood at about the seasonal expectancy.

Diphtheria.—Diphtheria incidence continued well below that for recent years, 1,776 cases being reported, as compared with 2,851, 2,533, and 2,139 cases for the comparable period in 1934, 1935, and 1936, respectively. Compared with the corresponding period in 1936, the North Atlantic and East South Central regions reported practically the same incidence, while in other regions the disease was considerably less prevalent.

Poliomyelitis.—The number of cases of poliomyelitis (78) reported during the current 4-week period was the same as that for the corresponding period in 1936, which was about the normal incidence for this season of the year. Of the various geographic regions, the East North Central, South Atlantic, and South Central reported slight increases over the totals for the corresponding peiiod in 1936, while the North Atlantic, West North Central, and Western regions reported decreases.

Typhoid fever.—For the 4 weeks ending March 27 the reported cases of typhoid fever totaled 423, as compared with 362, 385, and 508 for the corresponding period in 1936, 1935, and 1934. The South Atlantic and South Central regions reported increases over the corresponding period in 1936; the North Atlantic and East North Central regions reported decreases; and in the West North Central and

Western regions the incidence was practically on a level with that of last year.

Smallpox.—The number of cases of smallpox reported (1,920) was about 30 percent in excess of that for the corresponding period in 1936. In the Mountain and Pacific region the excess was approximately 65 percent; in the East North Central, 50 percent; in the South Central region, 23 percent; and in the West North Central, 15 percent. Only 5 cases were reported from the South Atlantic States and 5 (all in New York) from the North Atlantic regions. States mostly responsible for the high incidence were as follows: Missouri (303 cases), Kansas (145), Oregon (125), Illinois (120), Iowa (114), and Montana (97); almost three-fourths of the total number of cases occurred in those 6 States. For this period in 1935, 1934, and 1933 the numbers of cases for the entire reporting area were 695, 622, and 810, respectively.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended March 27, based on data received from the Bureau of the Census, was 13.1 per 1,000 inhabitants (annual basis). For the corresponding period in the years 1936, 1935, and 1934 the rate was 14.2, 12.7, and 12.8, respectively.

STUDIES ON TRICHINOSIS

I. The Incidence of Trichinosis as Indicated by Post-Mortem Examination of 300 Diaphragms

By MAURICE C. HALL, *Professor of Zoology*, and BENJAMIN J. COLLINS, *Laboratory Aide, Division of Zoology, National Institute of Health, United States Public Health Service*

INTRODUCTION

The diaphragms of patients dying in hospitals have been examined by a number of workers at various places in the United States with a view to ascertaining the extent to which trichinae are present in our population. At present, data are available on a rather large number of cases, but for various reasons it has seemed worth while to conduct a further study of this nature. For one thing, the hospitalized cases in Washington represent to an unusual extent a cross section of a rather large number of the population groups of the United States, and not just a cross section of a local or relatively homogeneous population. Another consideration is the fact that the previous studies have utilized but one of two available techniques for the examination of diaphragms, and certain limitations in either technique make the use of both techniques desirable. Still another consideration is the general lack of precise quantitative elements in almost all of the previous studies, and there are certain conclusions to be drawn from quantitative studies that cannot be drawn from studies not containing

quantitative elements. Further, numerous data which might be correlated with the occurrence of trichinae are generally lacking in previous studies, and we have attempted to obtain these data in our studies. Finally, a larger series of cases than has been reported is desirable to make the results statistically significant, and the present report on a series of 300 cases is a preliminary report on a continuing study in which we expect to cover a series of 1,000 cases as a base group, with certain population groups carried on beyond this base group. We use percentages, not with the idea that they are very accurate, but with the idea that they correctly represent trends.

MATERIAL AND DATA

The present study is part of a group research study on trichinosis in which the examination of diaphragms has been the major activity of one of us (B. J. C.), who made the large majority of the examinations reported here. A small minority of cases were examined by the other author and other workers in the Division of Zoology. Our material was obtained from the following hospitals, all in Washington, D. C., with one exception: Walter Reed General Hospital, covering a military population primarily associated with activities by land; the United States Naval Hospital, covering a military population associated with activities by sea; the United States Marine Hospital of the Public Health Service at Baltimore, Md., covering, among others, a civilian population associated with activities by sea; the Veterans' Administration Facility, Mt. Alto, covering, among others, a population which was at one time in a military group but which is primarily and most of the time a civilian group; St. Elizabeths Hospital, covering a population of mentally deranged cases which are commonly hospitalized for periods of years as opposed to the relatively short periods of hospitalization in hospitals in general; Freedmen's Hospital, covering a representative Negro population; Gallinger Municipal Hospital, covering cases of relatively low economic-social status from the mixed population of the District of Columbia; Children's Hospital, covering a group of children up to 13 years of age; and George Washington University Hospital, Georgetown University Hospital, and Garfield Hospital, covering cases of somewhat higher economic-social status than those from Gallinger and coming from the general population of Washington. The first five of these hospitals have patients from all over the United States, and the others receive patients from Washington, which, more than any other city in this country, has a population representing practically all parts of the United States.

With these cases as a basis, we expect to be able to study the correlations of the incidence of trichinae with such data as military or civilian status, association with land and sea, high and low economic-social status, mental derangement associated with long hospitalization,

and the absence of any such derangement associated with prolonged hospitalization, as well as to study correlations with sex, race, and age. These correlations are to be considered in a second paper by Hall and Collins. At the present time such correlations can be made only tentatively, but with more adequate data somewhat precise correlations may be expected. We are greatly indebted to the following for supplying diaphragms and data in our cases: the administrative officers of the various hospitals; Lt. Col. F. H. Foucar and Miss R. L. Clarke, at Walter Reed; Capt. U. R. Webb, Capt. H. W. Smith, Comdr. Paul W. Wilson, and Comdr. Harold E. Ragle, at the Naval Hospital; Dr. T. B. H. Anderson and Dr. H. L. Wollenweber, of the United States Marine Hospital at Baltimore; Dr. Lewis G. Beardsley and Dr. Robert Keilty at Mt. Alto; Dr. William A. White, Dr. K. H. Langenstrass, Dr. H. C. Wooley, Dr. S. A. Silk, and Dr. Nathan N. Root, at St. Elizabeths; Dr. Robert S. Jason, Dr. H. A. Poindexter, and Dr. Chas. R. Drew at Freedmen's; Dr. H. H. Leffler and Mr. R. R. Boyle, at Gallinger; Dr. J. W. Lindsay, at Children's and Garfield; Lt. Comdr. Roger M. Choisser, at George Washington, and Col. E. R. Whitmore, at Georgetown.

METHOD

The method used by us in examining diaphragms for trichinae was as follows:

In the first 31 cases an indeterminate amount of muscle was examined microscopically, and was weighed if trichinae were found. Subsequently, one gram of muscle, either from the muscles near the tendinous portion or partly from this region and partly from other regions of the diaphragm, was first weighed; the muscle was then cut into small pieces, placed between relatively heavy glass plates about 4.5 millimeters thick, and then compressed by two bolt and nut arrangements acting directly on the glass or on a metal frame which, in turn, acted on the glass. This press preparation was then examined microscopically. All trichinae found were recorded directly in terms of trichinae per gram, and a notation made as to whether the cysts were or were not calcified, and whether the trichinae were alive or dead.

The remainder of the diaphragm was weighed, ground in a meat grinder, and digested in an incubator room in artificial gastric juice (0.5 percent pepsin, 0.7 percent hydrochloric acid, and 1 liter of water). As a rule, the largest amounts which were multiples of 25 or 50 grams were used for the digestion, and if the amount was less than 50 grams all the material available was digested. The maximum amount, used in many cases, was 200 grams; the average for 300 cases was 113 grams. After digestion for approximately 24 hours, the material was

poured on the screen, using 80- to 100-mesh screens, in a Baermann apparatus, and allowed to stand for an hour or longer, and the material coming down in the funnel was then drawn off and examined for trichinae. If the findings were positive, additional amounts were examined until they were negative. Beginning with the thirty-fifth diaphragm, all of the fluid in the funnel was then drawn off and the apparatus was again filled with water warmed to 45° C.; after an hour the material coming down was drawn off and examined for trichinae. In five cases additional numbers of trichinae were found by this procedure. The screen was examined for any trichinae that might have remained on it, and in two cases trichinae were found. In 210 cases the material remaining on the screen from the Baermann examination was dried on absorbent paper, and 1 gram of this residue was examined microscopically for trichinae. Calcified trichinae were found in eight samples of this material, all of them previously positive by the direct microscopic examination.

LIMITATIONS OF METHODS

In the previous literature on examinations of diaphragms for trichinae, the investigators have used either direct microscopic examination alone or the digestion-Baermann method alone, or have merely reexamined a part of their positive material by a second method. Queen (1931) reexamined part of his series of 75 positives as ascertained by digestion, sectioning 73 and making press preparations of 29. Any failure to use both the direct microscopic and the Baermann method is practically certain to miss some positive cases. Microscopic examination of any given amount of material is likely to miss approximately half of the cases in which there is an average of only 1 trichina for the given amount of material examined, and will miss almost all of the light cases in which there is an average of less than 1 trichina present for any given amount of material examined, regardless of whether the trichinae are alive or dead. In other words, microscopic examination will probably miss cases of light infestation with either live or dead trichinae. On the other hand, the use of the digestion method will detect the presence of live trichinae rather dependably even when they are present in very small numbers; but since the efficiency of the Baermann apparatus depends for its effect on the movement of live worms and the effect of gravity in bringing down these moving worms, the digestion method is of little value for the detection of dead trichinae unless these are present in numbers large enough to insure that some of them will land directly on the screen and fall through.

Our study of incidence by the use of two techniques affords an opportunity to check the value and limitations of each technique, and

to make a very tentative estimate of the probable error in previous studies, in all of which only one of these techniques was used. The performances of the microscopic technique and of the digestion-Baermann technique, as shown in table 1, were as follows:

Microscopic technique.—This technique detected 27 of 41 positives, or 65.85 percent, and failed to detect 14 positives, or 34.15 percent; it failed in slightly more than one-third of the positive cases. Consequently, if the reports in the literature of microscopic examinations alone had been based on the examination of 1 gram of diaphragm muscle, as ours was, the incidence reported would be approximately 50 percent greater than the figure reported. Unfortunately, weighed amounts were not used by other workers nor did they always use the diaphragm, and so we cannot apply our correction figure accurately, but we can say with considerable assurance that their incidences are too low, and may surmise that if all their figures are combined the true incidence for the totals might be approximately 50 percent greater than the average reported. If we take the figures from table 3, so far as they are based on microscopic examinations alone, 5 papers report a total of 676 examinations with 51 positives, or an average of 7.5 percent. Applying our correction figure tentatively, and with no assumption that it will be at all accurate, we have an indicated incidence of 11.3 percent. This figure is probably closer to the actual incidence than that given.

In our total of 41 positives, the microscopic technique and the digestion-Baermann technique were both positive in only 15 cases, or 36.59 percent, indicating that both techniques will be in agreement in only approximately this percentage of all positives present. The nature of the cases which will be detected and of those which will be missed by the microscopic technique alone is indicated by a consideration of the nature of the infestations, whether with live, mixed, or dead trichinae. Out of 13 cases in which we found only live trichinae, about 31.7 percent of our positives, the microscopic examination detected 3 cases, or 23.1 percent, and missed 10 cases, or 76.9 percent. Out of 18 cases in which we found only dead trichinae, about 43.9 percent of our positives, the microscopic examination detected 16 cases, or 88.9 percent, and missed 2 cases, or 11.1 percent. Out of 10 cases in which we found both live and dead trichinae present, about 24.4 percent of our positives, the microscopic examination detected 8 cases, or 80 percent, and missed 2 cases, or 20 percent. All of the cases missed were light infestations with less than 1 trichina per gram, thereby supporting the statement already made that the microscopic examination will miss almost all of the light infestations, whether with live or dead trichinae, usually missing those present in amounts of less than 1 trichina per gram.

Digestion-Baermann technique.—This technique detected 29 of 41 positives, or 70.7 percent, and failed to detect 12 positives, or 29.3 percent. Consequently, if the reports in the literature of digestion-Baermann examinations alone had been based on the examination of the entire diaphragm, so far as it could be examined in multiples of 25 or 50 grams, and of all in which the amount was less than 50 grams, the incidence reported would be approximately 23.3 percent greater than the figure reported. These amounts were not used by other workers, and so we cannot apply our correction figure with any accuracy, but we can be sure that their figures for incidence are too low. If we take the figures from table 3, so far as they are based on the digestion-Baermann examination alone, 3 papers report a total of 802 examinations with 130 positives, or an average of 16.2 percent. Applying our correction figure tentatively, we have an indicated incidence of about 23 percent. This figure is probably closer to the actual incidence than that given.

The nature of the cases which will be detected and of those which will be missed by the digestion-Baermann technique alone is likewise indicated by a consideration of the nature of the infestations. Out of 13 cases in which we found only live trichinae, and 10 cases in which we found both live and dead trichinae, the digestion-Baermann examination detected every case, or 100 percent. Out of 18 cases in which we found only dead trichinae, this method detected only 6 cases, or 33.3 percent, and missed 12 cases, or 66.7 percent. In the cases missed by the digestion-Baermann method, trichinae were found by the microscopic method in numbers from 1 to 54 per gram, with an average of approximately 11 per gram. In the 6 cases detected by the digestion-Baermann examination, our calculation on numbei of trichinae shows less than 1 per gram; but in the 4 cases in which the microscopic examination also was positive the numbers found are 3, 5, 21, and 993 per gram. The evident explanation is that the dead trichinae found by the digestion-Baermann method came down in the Baermann funnel through the accident of landing on the screen. Assuming that we had 100-gram samples of diaphragm, even our lightest microscopic finding, 3 per gram, would mean that with approximately 300 trichinae present a couple might fall on the screen and come through, thus accounting for our finding of 0.02 trichina per gram in this case. Similarly, with 993 per gram found by the microscope, only 23, out of an indicated 99,300 in the sample, came through in the Baermann funnel. These figures assume uniform distribution of the trichinae in the sample, but presumably it is not uniform.

These findings establish our statement that the digestion-Baermann examination will miss dead trichinae, as a rule, unless they are present in numbers sufficiently large to insure that some of them will fall on the screen and come through. In the two cases missed by the micro-

scope and detected by the digestion-Baermann method, the true figures for trichinae per 100 grams are evidently nothing like the 1.3 and 3 trichinae actually estimated. In the 4 cases in which dead trichinae were found by both methods, the comparative figures in terms of trichinae per 100 grams are for the Baermann and the microscope, respectively, 1 and 2,100, 3 and 300, 4 and 500, 23 and 99,300, ranging from 100 to 4,317 times as great for the microscope as for the Baermann. Taking the lowest figure, 100, as our multiplier, our findings of 1.3 and 3 trichinae per 100 grams would represent a theoretical minimum of 130 and 300 trichinae per 100 grams, and the failure of the microscopic examination to detect these cases was probably merely an example of the law of chance operating to produce a failure when the odds were 130 to 100, or 300 to 100, in favor of our finding them.

If we exclude from the total of 1,778 cases in table 3 the 300 cases reported by us and based on two techniques, leaving 1,478 cases, and exclude from 222 positives our 41 positives, leaving 181 positives, and correct the number of positives by microscopic technique alone and by digestion-Baermann technique alone, we have an indicated 260 positives, or an incidence of 17.6 percent. Combining this with our figure would give a total of 1,778 cases with 301 indicated positives, or an incidence of approximately 17.5 percent. We cannot conclude very much from figures of this sort or of this size, and especially as manipulated on tentative assumptions which rest on an admittedly inadequate basis. However, we are looking for the indicated incidence of trichinosis on the basis of what data are available, and the indicated incidence of over 17 percent is probably lower than the true incidence.

We have already shown that neither the microscopic nor the digestion-Baermann technique will pick up very light infestations with dead trichinae except incidentally and accidentally whenever a positive turns up, with the odds against its turning up. We find more cases with only dead trichinae (18 positives) than with only live trichinae (13 positives), in spite of the fact that by means of the digestion-Baermann method we are much more certain to detect live trichinae. Hence the likelihood of missing some cases with only dead trichinae, especially light cases, is very great, and all figures, including our own, are evidently too low for this reason. In our infestations with live trichinae, light infestations predominate, and one might assume that for every case of light infestation with live trichinae there would be a corresponding light infestation with dead trichinae which was not detected. However, this assumption cannot be safely made at present, since there is the possibility that trichinae in heavy infestations may calcify and die much more rapidly than trichinae in light infestations, a possibility which finds some evidence

in the fact that dead trichinae predominate in the heavy infestations found.

As regards the use of the diaphragm alone as a basis for studies, we note that Thornbury (1897), in a study of 1,043 cases of trichinosis in swine, found trichinae in the diaphragm in 76.6 percent of his cases, leaving 23.4 percent of positive cases, or almost one-fourth, in which the diaphragm sample, his best indicator, was negative in spite of positive findings in loin or neck muscles or both. Evidently, then, all incidences based on microscopic studies of diaphragms are too low on the basis of this finding alone and aside from other considerations already given.

We have tested the possibility of detecting light cases of infestation with dead trichinae by the use of long wave-length X-rays, also termed soft X-rays or Grenz rays, of low penetrating power. So far our attempts to find calcified trichinae by direct observation have been unsuccessful. We have not tried photography by such methods as are described by Sherwood (1934), but a grossly infested specimen, with calcified trichinae, was examined in this way by the research laboratory of the Eastman Kodak Co. and an excellent photograph and an enlargement, sent to us by Dr. R. B. Wilsey, show the cysts very well. However, this method of examination does not seem applicable to the routine examination of large numbers of diaphragms, especially since any calcified areas would have to be located, excised, and examined microscopically.

INCIDENCE

The details of our findings are presented in table 1. The findings, as already noted, indicate that the previously published findings of other workers, based on only one of these methods, give too low an incidence, but as these workers, with the exception of Queen (1931), who used "approximately" 50 grams, and McNaught and Anderson (1936), who used 50 grams, did not use weighed amounts of diaphragm, our correction figures cannot be applied to them except in a tentative way. All findings, including our own, are evidently low, since positive findings of trichinae are rather dependably correct, the trichinae whether alive or dead, uncalcified or calcified, being practically unmistakable, whereas negative findings are more or less inconclusive.

TABLE 1.—*Findings for positive cases*

Positive no.	State of trichinae	Findings		Number per gram	
		Microscopic	Digestion	Microscopic	Digestion
1	Live	Negative	Positive	0	0.187
2	Dead	Positive	Negative	600	0
3	Live	Negative	Positive	0	.006
4	Dead	Positive	Negative	54	0
5	Live	do	Positive	5	.48
6	Mixed	do	do	85	.04
7	Dead	do	Negative	12	0
8	Live	do	Positive	1	.04
9	do	Negative	do	0	.04
10	Dead	Positive	Negative	2	0
11	Live	Negative	Positive	0	.035
12	Dead	Positive	do	21	.01
13	do	Negative	do	0	.013
14	Mixed	do	do	0	.08
15	Live	do	do	0	.133
16	Dead	Positive	Negative	14	0
17	do	Negative	Positive	0	.03
18	Live	do	do	0	.041
19	Dead	Positive	do	3	.02
20	do	do	Negative	2	0
21	Mixed	do	Positive	47	1.2
22	Dead	do	do	5	.04
23	do	do	Negative	1	0
24	do	do	do	3	0
25	Mixed	do	Positive	5	2.12
26	Live	Negative	do	0	.43
27	do	do	do	0	.03
28	Dead	Positive	do	993	.23
29	do	do	Negative	11	0
30	Mixed	do	Positive	16	.39
31	do	do	do	2	.06
32	Live	Negative	do	0	.08
33	Mixed	do	do	0	.26
34	do	Positive	do	3	1.77
35	Live	Negative	do	0	.02
36	Dead	Positive	Negative	3	0
37	do	do	do	1	0
38	do	do	do	12	0
39	Mixed	do	Positive	7	.02
40	do	do	do	1	.35
41	Live	do	do	2	.12

Number with live trichinae only, 13, or 31.7 percent (Queen (1931), by digestion only, found about 61.3 percent).
Number with dead trichinae only, 18, or 43.9 percent (Queen found about 25.3 percent).
Number with live and dead trichinae, 10, or 24.4 percent (Queen found 13.3 percent).

Using the quantitative data obtained, we are in a position to make some tentative estimates as to the severity of infection in the various positive cases found in our examinations. It is impossible to do this very accurately, so far as clinical correlations are concerned, since the literature, so far as we have examined it, does not afford an adequate background, and there are obvious possibilities of error of other sorts. As yet we do not have adequate data as to the distribution of trichinae in the diaphragm, the one observation that the literature seems to agree on being that the trichinae are most numerous in the muscles near the tendinous portions of the diaphragm. Thus, the finding of 1 trichina per gram in a microscopic examination of 1 gram of diaphragm muscle does not indicate too dependably that the entire diaphragm, if it weighs 100 grams, therefore contains 100 trichinae, although this figure may be used as an estimate with reservations to

the effect that the figure cannot be taken too seriously. Translating such an estimate into terms of number of trichinae present in the individual patient is still more uncertain. The diaphragms sent to us were often incompletely removed or were only samples. The proportion of weight of muscles to entire body weight is a variable in different individuals and in any given individual from time to time. If we assume, for the purposes of rough estimate, that the somatic musculature weighs approximately half the total body weight, it is still necessary to use a somewhat dependable factor indicating the relative proportion of trichinae in the diaphragm to the total number present in the body, and while such factors occur in the literature, they are not entirely applicable for our purposes. A readily available figure is given by Ostertag (1919), who states that Kuehn, on an examination of 3 hogs moderately infested with trichinae, found 25.3 percent of the trichinae present to be in the diaphragm. It is not safe to assume that the findings on three moderately infested hogs are generally applicable even to hogs, much less to human beings; but for tentative estimates, and until we obtain adequate data, one might assume that the number of trichinae present in an entire diaphragm represented approximately one-fourth of the total number present in the body. However, the extensive data reported by Thornbury (1897), on samples from 1,043 cases in swine, are by no means in agreement with Kuehn's findings.

Correlations of the number of trichinae per gram with the presence or absence of clinical symptoms cannot be made because of a practically complete lack of basic data, and also because the clinical picture of trichinosis is highly variable, largely unstudied and unknown, contrary to the general assumption. In general, the over-simplified classical picture of trichinosis as given in the text books is the only form of the disease which is usually considered, and even in cases in severe epidemics, on which the classical picture is based, there are wide departures from the classical syndrome.

In our series of 41 positive cases none had a history of any previous diagnosis of trichinosis, and this is true for all of the 222 positive cases reported in table 3. Yet in 1 of our cases (no. 28) there were between 900 and 1,000 trichinae per gram of diaphragm muscle. Chandler (1926) notes an epidemic in Portland, Oreg., in which the sausage responsible for the outbreak had over 2,000,000 larvae per pound (a little over 900 per gram), and an Italian who died in the epidemic had a number of larvae "even greater." While the precise number per gram in the human victim is not given, it seems safe to assume that, in this fatal case, the number of trichinae was comparable to the number in our heaviest case; yet in this latter case, with rather better than the usual anamnesis covering it, the records show only measles and a gunshot wound, the patient denying other illnesses.

Williams, in his cases, specifies one-third of the infestations as severe, one-third as moderate, and one-third as mild, but there was no diagnosis of trichinosis connected with even the 9 severe cases. As a base figure for extremes of infestation, we note that Schumann and Ludwig, cited by Ostertag (1919), report the extraordinary figure of almost 4,000 (actually 3,961) trichinae per gram for a hog, and that Roth (1935) reports 10,000 per gram in an artificially infected guinea pig.

INTENSITY OF INFESTATION

As a basis for further consideration we may divide our cases into groups of lighter to heavier infestations, accepting the direct microscopic findings per gram whenever positive, because of their direct and positive character, and accepting the digestion-Baermann findings per gram for the other cases, arbitrarily making the groups shown in table 2.

TABLE 2.—*Positive groups on a basis of trichinae per gram*

Group no.	Larvae per gram	Number of cases	Percent	Number in various states		
				Live	Mixed	Dead
1	Less than 1	14	34	10	2	2
2	1 to 10, inclusive	16	39	3	5	8
3	11 to 50, inclusive	7	17	0	2	5
4	51 to 100, inclusive	2	4.9	0	1	1
5	101 to 500, inclusive	0	0	0	0	0
6	501 to 1,000, inclusive	2	4.9	0	0	2
7	Over 1,000	0	0	0	0	0

From the table it is evident that in group 1, infestations with less than one larva per gram, the large majority of cases show only live larvae, whereas in all other groups, with one or more larvae per gram, mixed infestations predominate over those with live larvae, and infestations with dead larvae predominate over both other groups. Group 2, with next to the lowest number per gram, is the only group other than group 1 showing any cases with only live larvae present, and these constitute only a small percentage of that group. One may readily explain the small number of cases showing less than 1 larva per gram and with only dead larvae present, as has already been indicated, by the fact that the mathematical chance of finding such infestations by direct microscopic examination is exceedingly small, and that the digestion-Baermann examination has little utility in such cases, but why do 8 cases with only dead larvae present, and present in such relatively large amounts as 11 to almost 1,000 larvae per gram, have no counterpart in the form of cases with only live larvae present in similarly large numbers? The chance of oversight with such numbers can be ruled out, as either the direct microscopic or digestion methods could be depended on to find these cases.

The age factor alone seems to have little bearing on the case, since live trichinae alone, in infestations from less than one per gram up to 10 per gram, occur in the various decades of age as follows: First, 1 case; third, 2 cases; fourth, 3 cases; fifth, 3 cases; sixth, 3 cases; seventh, one case. Why these 13 light live infestations, occurring in six decades of age distributed from infancy to the sixties, are not matched by at least some heavier live infestations is not clear to us from the data and background available. It might be explained, as one possibility, on the theory that the rapidity with which trichinae die and calcify is proportional to the degree of infestation; but this appears to be purely theoretical at present, since we know of no data in the literature which would afford substantial evidence for this theory. However, this theory should be considered as new data are obtained.

The only other quantitative study with which we can make comparisons is that of McNaught and Anderson (1936). Since they used only the digestion method and report that "Living trichinae were found in all the positive cases", we can assume that they had both live and mixed infestations, and by reducing their figures to larvae per gram we can compare them with our figures for 23 live and mixed cases as obtained by digestion (table 1). On that basis we have the following: Less than 0.4 larva per gram, 79 percent (M. and A.) or 78.3 percent (H. and C.; 18 cases); 0.4 to 2 larvae per gram, 12.5 percent (M. and A.) or 17.4 percent (H. and C.; 4 cases); over 2 to 76 larvae per gram, 8.5 percent (M. and A.) or 4.3 percent (H. and C.; 1 case). These figures are in agreement in showing that, so far as live trichinae are concerned, very light infestations are the rule (between 75 and 80 percent), that slightly heavier infestations are much scarcer (between 10 and 20 percent), and that moderate infestations are a very small group (less than 10 percent).

On the basis of table 2, one can make only a tentative and subjective estimate as to the severity of the infection and the probable occurrence of visible symptoms in the various groups. However, it seems safe to say that in infestations with distinctly less than 1 larva per gram, especially the cases with less than 10 larvae for each 100 grams of diaphragm muscle, symptoms are either absent or negligible, and it seems equally safe to say that in infestations with over 100 larvae per gram there must be pronounced clinical symptoms, including at least part of the features of the classical picture of trichinosis, and that these cases are definitely severe cases. Over the range between these two extremes there are probably disease symptoms of a polymorphic nature, probably more or less atypical, which symptoms are not recognized as indicative of trichinosis for the reason that this group of cases is an unstudied group. Until we have a relatively large amount of data from the clinician, pathologist, and parasitologist,

with some quantitative findings in known clinical cases, and these data are intelligently coordinated and interpreted, we shall probably fail to diagnose these cases correctly. Presumably they will include vague cases diagnosed as acute bacterial infections, rheumatic fever, intercostal neuritis, intestinal influenza, eye diseases of various sorts, heart diseases of various sorts, various derangements of the nervous system, and other conditions, depending on the point at which the parasite's invasion finds the weakest spot or produces the most noticeable derangement.

CORRELATIONS WITH PUBLISHED FINDINGS

Having recorded our observations on incidence, it is in order to pick up the data afforded by the published literature as a basis for some conclusions as to the indicated prevalence of trichinae and trichinosis in the United States. These data are summarized in table 3.

TABLE 3.—*Incidence in the United States of trichinae found post mortem, as reported in the literature*

Author	Date	Place	Number of examinations	Positive	Method	Percent
Kerber [1]	(?)	San Francisco, Calif.	13	0	Microscopic	0
Whelpley	1891	St. Louis, Mo.	20	1	do	5
Thornbury	1897	Buffalo, N. Y.	21	3	do	14.3
Williams	1901	do. [2]	505	27	do	5.35
Queen	1931	Rochester, N. Y.	344	59	Digestion	17.15
		Boston, Mass.	58	16	do	27.6
Riley and Scheifley	1934	Minneapolis, Minn.	[3] 117	20	Microscopic	17.09
Hinman	1936	New Orleans, La.	[4] 200	7	Digestion	3.5
McNaught and Anderson.	1936	San Francisco, Calif.	200	48	do	24
Hall and Collins (this paper).		Washington, D. C., and Baltimore, Md.	300	41	Microscopic and digestion.	13.67

[1] Cited by Williams; not seen.
[2] Cases from Buffalo and elsewhere in New York State, and from Philadelphia, Baltimore, and Denver.
[3] The "1 series of 50" mentioned by Riley and Scheifley is part of their series of 117 cases, not an additional series as some writers have thought (confirmed by Dr. Riley in correspondence).
[4] Cases of 25 infants, all negative, omitted from this total.

Total number examined, 1,778. Total found positive, 222. Arithmetical percent positive, 12.5.

The percentage obtained here, 12.5 percent, cannot be taken on its face value either as an average or as an index, without reservations. As an average of unweighted figures it cannot be used as a basis for precise mathematical treatment, and no such treatment is attempted here. Aside from this fact, there are several variables in the base figures, such as differences in method, differences in amount of material examined, and changing factors over a period of almost 50 years so far as American food habits and methods of raising swine are concerned. Nevertheless, these 1,778 necropsy results for 11 cities widely distributed over the United States indicate a high incidence of trichinae throughout the population of the United States. Our material was from 11 hospitals, McNaught and Anderson's from 5 hospitals,

and others' apparently from 8 hospitals, or a total of 24 hospitals. The flaw in the percentage, as previously noted, is not that it is too high, but that it is too low.

As regards the use of the direct microscopic method used by 5 workers in a total of 676 cases, with 51, or about 7.5 percent, positive, our findings indicate that the use of this method alone will miss approximately 34 percent of positive cases, and that the use of both methods in these series, assuming that other factors are the same—which they are not—would have given a figure closer to 11 percent. Thornbury (1897), in a study of 1,043 cases of trichinosis in swine, found trichinae in the diaphragm in 76.6 percent of his cases, leaving 23.4 percent of positive cases, or almost one-fourth, in which the diaphragm sample, his best indicator, was negative. Evidently, then, all incidences based on microscopic studies of diaphragms are too low. Our correction figure, 34 percent missed, is based on 2 techniques on diaphragms only, whereas his figure, 23.4 percent missed, is based on microscopic technique only, on diaphragm, loin, and neck.

As regards the use of the digestion-Baermann method used by three workers in a total of 802 cases, with 130 positives, or 16.2 percent, our findings indicate that the use of this method alone—again assuming that other factors are the same—will miss approximately 29 percent of positive cases, and, therefore, that the use of both methods in these series would have given a figure closer to 23 percent. For the entire series of 1,778 examinations, our findings indicate that, with the use of both methods, there would have been approximately 301 positives, or approximately 17.5 percent.

The above calculation assumes that, aside from method, procedures were comparable. Actually, they are not comparable. As regards the amount of material examined, we note the following: We have not seen Kerber's paper; Whelpley and Thornbury say nothing about amounts; Williams used samples, usually 3 centimeters long by 1 to 2 centimeters wide and thick, including, usually, diaphragm muscle; Riley and Scheifley used, on an average, 5 square centimeters of compressed muscle to a slide; Hinman used small pieces, about 2 inches square, of diaphragm muscle; Queen used "approximately 50-gram portions of muscle" from the diaphragm; McNaught and Anderson used 50 grams of diaphragm muscle. Obviously, there are many variables here. The present writers examined 1 gram directly, and used for digestion, in the large majority of cases, as much diaphragm as could be obtained and weighed in multiples of 25 and 50 grams, unless there were less than 50 grams available, in which case all the available material was used, and the use of these amounts, in many cases 200 grams and an average of 113 grams, or much more than other workers used, probably resulted in finding a higher percentage

of positives than would have been found by using the smaller amounts used by other workers.

As regards factors affecting pork as food, the present status is somewhat different from that of the period covered in the papers by Williams and his predecessors. It is quite probable that the numerous cases of light infestations, with less than 10 larvae per 100 grams of diaphragm muscle, of which there were 10, or almost 25 percent, among our 41 positive cases, are cases of a type which was very rare previous to the early days of this century. For thousands of years the slaughter of swine has been conducted on a small-scale basis, from slaughter of an individual animal on the farm or elsewhere to the slaughter of a few animals at some such point as the country slaughter house. Under such conditions, not only pork but also pork products (sausage, etc.) originated, as a rule, with individual animals and were either free from trichinae or definitely well supplied with trichinae and definitely dangerous, as a rule. Since the meat inspection figures cited by Ransom (1915) for trichinae in American export swine, for the period 1898–1906 during which microscopic examinations were made and reports on live trichinae published, showed 1.41 percent of over 8,000,000 swine to be infested with live trichinae, anyone at that time eating raw or undercooked pork products was usually eating pork from only one hog, and had only 1.41 chances in 100 of becoming infested with trichinae, but the chances were probably 100 to 1 that if a person became infested he would have a clinical case of trichinosis. Today it is no unusual thing for the pork trimmings from 100 or more hogs to be made up into sausage or some other pork product, in one of our large packing establishments. The effect of this appears to have been stated first by Ransom (1915). If we have today approximately the same percentage of trichinous swine, as Hall's (1935) report and Schwartz's (1936) report indicate, the chance of becoming infested with trichinae from eating raw or undercooked sausage or similar pork products is vastly greater than it formerly was, since the trimmings from one trichinous hog will be mixed with the trimmings from 99 uninfested hogs in such a way that practically all of the trichinae present will be more or less uniformly distributed throughout the product.

The chance of swallowing some live trichinae in raw or improperly cooked pork products may be something less than 100 to 1; but if they are swallowed, the chances are great that they will not produce clinical trichinosis because of the dilution factor. Taking all of our 41 cases as a basis, it appears that on that basis, infestation from all sources in our series resulted in zoological nonclinical trichinosis in about 25 percent of our cases (those with less than 10 larvae per 100 grams), in what must have been severe clinical trichinosis in at least

4.9 percent of our cases (those with over 100 larvae per gram), and in clinical trichinosis, more or less atypical, in about 70 percent of our cases.

CORRELATIONS OF INCIDENCE WITH REGIONAL DISTRIBUTION

An inspection of table 3 with reference to incidence and geographic distribution suggests some interesting correlations. In general, writers have attempted no explanation for their findings of higher or lower incidence as compared with findings elsewhere, but it seems advisable to open up a consideration of this subject with a theory which can be supported by some facts, thereby focusing attention on the explanation of the variations in incidence. It will be noted that the incidence is highest in Boston and San Francisco, and that the next highest incidences are in regions north of Washington, D. C., and that all these incidences outside of Washington are evidently too low by comparison with the Washington figures for the reason that they were obtained by only one method, thereby ensuring that one group of positives would be missed rather generally. An extension of these findings, that the incidence is high at Eastern and Western seaports, is the finding that the lowest incidence is that from the far South at New Orleans. From the data available to us we are inclined to think that any attempt to correlate these findings with the food habits of persons in these areas, the association that one would naturally think of first, would be unsuccessful.

The correlation which we believe exists is between incidence of trichinae in persons and incidence of trichinae in the swine from which these persons obtain their pork and pork products. Tentatively, we divide these cases into four groups: (1) The highest (Boston and San Francisco), (2) the lowest (New Orleans), (3) the sample apparently representing the most groups of diverse sorts (Washington), and (4) the intermediate between the highest and lowest (all other localities). We suggest that these are correlated with the eating of pork from swine which are handled in the following ways: (1) The highest incidence with a mixed swine supply having a rather large proportion of garbage-fed hogs and swill-fed hogs in it; (2) the lowest with a swine supply in which hogs are run at large in woods and fields, often not under fence, and including everything from purebred hogs to razorbacks; (3) the Washington sample with a swine supply raised under all sorts of conditions everywhere in the United States; and (4) the intermediate with a swine supply which is raised under conditions ranging from the excellent McLean County swine sanitation system to the swill-fed hogs of the dirty hog lot.

We have resolved the old problem as to the source of trichinae in swine, whether from rats, or swine carcasses, or raw and undercooked pork scraps in garbage and swill, in favor of the idea that pork scraps

in garbage and swill are the important sources of trichinae in swine and, hence, of trichinae in man. This is a conclusion which was arrived at almost a half century ago by Mark (1889), in very competent reasoning based on sound observations around Boston, a work which has been quite generally overlooked in the subsequent literature on the subject. At almost the same time, Calvin (1890), in Iowa, published data supporting the same thesis, although he drew from them what seem to be somewhat unwarranted conclusions. Hall (1935) and Schwartz (1936), as noted in the next paragraph, have recently published confirmatory data.

Accepting this thesis as correct, we would explain the geographic distribution of trichinae in the United States as follows:

(1) There are on the Eastern seaboard large garbage-feeding establishments supplying pork to Eastern cities, including such important ports as New York, Philadelphia, and Boston, and we suspect that these establishments are largely responsible for the relatively high incidence of trichinae at Boston, as they are known to be responsible for some of the outbreaks of human trichinosis in New York City and nearby points. In addition, the practice of swill-feeding is common in New England. Similarly, there is on the West Coast a very large garbage-fed hog industry, including what is probably the largest plant of the sort in the world, supplying pork to such important ports as San Francisco and Los Angeles, and to this fact we attribute the high incidence of trichinae in San Francisco. Hall (1935) has reported the incidence of live trichinae in grain-fed hogs as 1.5 percent, and in garbage-fed hogs as 4.8 percent, or more than three times as high in garbage-fed hogs as in grain-fed hogs, and, in a later report, Schwartz (1936) has stated that the incidence in grain-fed hogs was about 1 percent, and that in garbage-fed hogs about 5 percent, or five times as high in garbage-fed hogs.

(2) Throughout the South, in spite of a gradual trend to other methods, swine are still allowed to run at large to a great extent, often feeding on acorns in oak forests after the manner of the mast-fed hogs of England, and frequently living out in the fields or woods with little attention and no feed aside from what they can find for themselves until they are brought up for fattening on peanut fields or on other crops previous to slaughter or shipment. Under such conditions they are not exposed to any great extent to infection with trichinae. Dr. L. A. Spindler, of the Bureau of Animal Industry, states that he found a very low incidence in swine in Georgia.

(3) As already noted, the Washington sample includes persons from widely distributed parts of the United States, representing exposure to infection with trichinae under all of the conditions prevailing throughout the United States and its possessions.

(4) Throughout the Middle West and in such States as New York and Minnesota, swine are raised under conditions ranging from those of the swine sanitation system, which Hall (1936) has pointed out as probably our best control measure for trichinosis, to those of the filthy hog lot with its swill-fed and slop-fed hogs, and these latter are probably the important determinants in the occurrence of trichinae in these areas of intermediate incidence. Obviously, studies of necropsy cases from the Rocky Mountain States, the Southwest, and the Alabama, Georgia, South Carolina, and Florida region, and of swine from various regions, are needed to complete our present picture.

IMPLICATIONS FROM INCIDENCE DATA

In general, previous writers have been content to report the incidence of trichinae as ascertained by them, and to state, in effect, that infestation with trichinae in the United States is not as rare a condition as it is commonly supposed to be. Unfortunately, percentages are not an impressive form of statement for the purpose of calling attention to an existing evil, and we now wish to put the question: What does the incidence of trichinae, as shown by their presence in 222 of 1,778 cadavers in the East, West, North, South, and intermediate regions, imply as to the actual number of cases of zoological and clinical trichinosis in the United States?

If we take our unweighted average of approximately 12.5 percent, a figure which for several reasons is obviously too low, as has already been pointed out, it implies that one out of every eight persons in our population of 130,000,000 persons is infested with trichinae, or approximately 16,000,000 persons above the age of infancy, provided the incidence in cadavers examined gives the incidence for the general population, an assumption that cannot be made at this time and on the available information. Many of the cases must represent severe clinical trichinosis, but at the most, only a few hundred such cases are ever diagnosed in any one year, and the implication is that relatively few of the actual cases are ever recognized. Not one of the 222 positives had a history of a disease diagnosed as trichinosis. Ransom (1915) states that in 1,550 cases in the United States from 1842 to 1915, there were 240 deaths, a case fatality of about 16 percent, but notes that these were severe cases, of a sort likely to be detected, and thinks the actual case fatality rate is much less. There are no sound mortality statistics, such as would take account of the more or less atypical cases not diagnosed at present; but if we assume, for the purpose of discussion, that severe clinical trichinosis, tentatively regarded here as produced by over 500 larvae per gram, has a case fatality rate of 1 percent, there would be many deaths from undiagnosed trichinosis annually. The facts are unknown, but we believe that a serious problem has been overlooked. Finally there are certainly serious

after-effects of clinical trichinosis in some cases, although the proportion of such cases to the total cases is unknown.

Are these implications substantially correct? The extent to which the trichinae infestations found by us in persons dying in hospitals would not have practically identical counterparts in persons dying at home or elsewhere, or, if we had suitable diagnostic methods, in the active and presumable well population of this country, is not known, although we are planning a study to give some information on this point. Notably, not one case of the 222 positives reported was a clinical case of trichinosis while hospitalized just previous to death, so the scales are not weighted in favor of a too high incidence by virtue of their origin as cases of trichinosis in hospitals. The answer to the question will have to come from further developments. However, let us suppose that our conclusions are exaggerated, and that the picture we present is 10 times as bad as the reality. Would a mere 1,600,000 infested persons, with the certainty that there were many overlooked cases of clinical trichinosis and of deaths from undiagnosed trichinosis, warrant respectful consideration? We shall assemble other facts on this subject in later papers, but at the moment we note only such selected items as seem most in order at this time.

The two parasitic worms which most certainly break through the barriers of modern sanitation are trichinae and pinworms, both of them worms which still have received wholly inadequate attention in research and in medical practice. The Federal meat inspection provides for such cooking, refrigeration, and processing as will destroy trichinae in meat products intended to be eaten without cooking. It does not provide for inspection of pork for trichinae, a procedure which would be very expensive and highly impracticable under high-speed American packing-house procedures, and it inspects only approximately 70 percent of the meat marketed in the United States. Outside of that inspection there is very little meat inspection by competent inspectors. A gap of approximately 30 percent in our meat inspection fence allows an ample supply of trichinae to drive through in pork products customarily eaten raw and permits these most deadly of the parasitic worms to reach their destination in human hosts.

For a variety of reasons, into which we cannot go at this time, the United States, so far as data are available, has the greatest problem in trichinosis of any country in the world, even though we suspect that the supposed incidence in some other countries is greater than it is thought to be. We emphasize here a point which does not seem to have been made in American literature, but we are not the first to make the point. About 50 years ago, R. Blanchard (1887) stated that the extreme abundance of trichinae in swine raised in the United States warranted the statement that trichinosis is very common there in man, perhaps more common even than in Germany, the other

outstanding area of infection, and raised the question as to whether trichinosis originated in the New World, a question which he answered, correctly as we believe, in the negative. Joyeux (1922) stated that, during the second half of the nineteenth century, there were two principal foci of infection with trichinosis, namely, the United States and northern Germany. According to Ostertag (1919), there is a constantly decreasing incidence of trichinae in swine in Germany, the incidence even in 1919 being a small fraction of 1 percent. The available figures given by Hall (1935) and Schwartz (1936) on trichinae in swine in the United States at this time indicate no decline in porcine trichinosis from the former incidence of 1.41 percent for live trichinae present in 1898–1906. A consideration of the figures in table 3 indicates that the findings for human infestations in 1931 and subsequently, as compared with the findings for 1901 and previously, give no grounds for believing that there is a declining incidence in human trichinosis in the United States. That there would be some correlation between porcine and human trichinosis in any country can hardly be doubted.

In discussing our findings with Dr. D. A. Shorb, of the Bureau of Animal Industry, he made the remark: "Your human cases are running higher than our garbage-fed hogs." This is a rather impressive statement that deserves the thoughtful attention of the medical profession. We believe that this idea and the findings that we have brought out in this paper indicate correctly two striking facts: That the United States has the greatest problem in trichinosis of any country in the world; and that the problem is one of major importance, apparently affecting to some degree, at a conservative estimate, at least several million persons, with clinical trichinosis in some form affecting possibly several hundred thousand persons, and with possibly several thousand deaths. If the situation is even half as serious as it appears to be, then something in the way of organized and adequate action should be taken to fill the gaps in our existing knowledge by research, and to apply the known control measures to a much greater extent than they are applied at present.

CONTROL OF TRICHINOSIS

It would be ill-considered to point out this problem without giving at least brief consideration to the known control measures for trichinosis. They have been discussed by Hall (1936) and may be summarized as follows: Meat inspection of a quality equivalent to that of the Federal meat inspection system should be extended to all meat produced in the United States, either by an extension of the Federal inspection or by the development of equally sound systems under States, counties, or cities to take care of the 30 percent of meat not inspected by the Federal forces. The swine sanitation system,

under which swine are protected against trichinae by being raised on clean forage crops away from garbage, swill, hog carcasses and offal, and rats, should be much more widely used by hog raisers. This system gives a large measure of protection from various swine diseases, and makes money for the farmer, not only by preventing disease, but by raising hogs to market weight months earlier than in the case of hogs raised under dirty hog-lot conditions, and hence at a great saving in time and feed. Where hogs are fed on garbage or swill, it should be required by law that the garbage or swill be cooked to destroy trichinae, a procedure which is of great value also in preventing hog cholera and foot-and-mouth disease. Rat destruction by trapping and poisoning, carried out by trained experts whenever possible, should be much more extensively utilized.

The campaign to educate the public against the use of any raw pork, or of any pork products customarily eaten uncooked that do not originate in establishments under Federal inspection or an equivalent inspection, should be better organized and more intensive, since it is evident that the former idea that Germans and Italians constitute the preferred groups for trichinosis because of their food habits is no longer useful. It is only too evident that a large section of the American people as a whole have developed the habit of eating raw or improperly cooked pork and uninspected or inadequately inspected pork products, and we point to the eating of raw hamburgers, some of which contain pork as well as beef, as evidence of this habit. Pork is a wholesome and desirable form of meat, and its use should not be handicapped by unsound methods of raising swine or improper methods of handling or cooking the meat.[1] Finally, it is vital that

[1] The fact that trichinosis is common in the United States is not a reason for not eating pork, but is a reason for cooking it well. Precautions in preparing foods for use are not confined to pork or to the United States but are common to many foods and to all civilized countries. Beef, unless from a house under competent inspection, should also be thoroughly cooked to avoid the possibility of infection with the beef tapeworm. Fruits and vegetables are peeled or thoroughly cleaned before being used. Water supplies are treated, if necessary, for purification. Canned products in general are prepared according to certain specified scientific procedure. Foods attractive to man are attractive to microorganisms also, and so it becomes necessary, in handling fresh fruits, fresh vegetables, and fresh meats, to safeguard their freshness and wholesomeness from their source to the table. Continued vigilance is the price of excellence and quality, and meats and meat food products are no exception to this rule.

Pork is rich in protein, fat, and vitamin B. Investigations on the digestibility of meats reported by the United States Department of Agriculture, show that, on the basis of time required to leave the stomach, pork is digested in the stomach slightly more rapidly than turkey, in the same time as chicken, and slightly more slowly than beef or lamb.

For reasons of taste, as well as for precaution, fresh pork, fresh pork sausage, smoked hams and shoulders, bacon, and such products as smoked sausage, boneless loins, and coppa should be cooked until they are well done throughout before using. Thirty minutes to the pound is an approximate guide to sufficient cooking for large thick cuts of pork. Pork products of the sort customarily eaten without cooking by the consumer, consisting largely of various kinds of dry or summer sausage, are entirely safe to eat without cooking if prepared in an establishment operating under Federal meat inspection or other competent inspection, but should never be eaten without cooking unless they bear evidence of competent inspection. The pork used in such pork products is specially processed, under the close scrutiny of Government inspectors, to destroy any trichinae that may be present, the processing including cooking, special freezing, or special curing. There is no danger of acquiring trichinosis when proper care is used in the cooking of pork and pork products and in the selection of pork products customarily eaten raw to see that they have been prepared under competent inspection.

sound research on trichinosis, from the basic biology of trichinae to the development of dependable diagnostic procedures, a sound and effective therapy, and a comprehensive epidemiology, be extended and expedited.

SUMMARY

A study of 300 diaphragms from cadavers, coming from 10 hospitals in Washington, D. C., and 1 hospital at Baltimore, Md., shows 41 diaphragms infested with trichinae, an incidence of 13.67 percent.

The samples include cases from 5 Federal hospitals to which patients are sent from all over the United States, and from 6 Washington hospitals with cases originating widely over the United States, and they run the range of childhood to old age, military and civil life, association with land and sea, sane individuals and mentally deranged hospitalized cases, black and white, male and female, and high and low economic-social status.

All diaphragms were examined both by the direct microscopic method and by the digestion-Baermann method, since both methods have special value for certain types of infestation and both have certain limitations, the two methods being supplementary in these respects.

Examinations were made on a quantitative basis of trichinae per gram of diaphragm muscle examined. On this basis the series is arbitrarily divided into seven groups of lighter to heavier infestations, as a basis for tentative assumption and for further consideration.

Live trichinae predominate in light infestations and dead trichinae predominate in heavy infestations, and the theory is tentatively suggested that the rapidity of calcification may be proportional to intensity of infestation.

On the basis of 1,778 cases reported up to the present time, the writers conclude that an indicated incidence of approximately 12.5 percent, an unweighted average, is a conservative figure, probably definitely too low. If this figure is indicative of incidence throughout this country, there are probably several million persons in the United States who are infested with trichinae, among whom are possibly several hundred thousands who have had clinical trichinosis never diagnosed as such, and there are possibly several thousand deaths annually from this cause.

The following point is emphasized: That the United States apparently has the greatest problem of trichinosis of any country in the world, a problem involving, in one way or another and in some degree, several million persons. The incidence in man is greater than the incidence in garbage-fed hogs.

The background of the problem is considered, and an outline of the measures necessary for the control of the parasite, *Trichinella spiralis*, is given.

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HOSTS OF THE IMMATURE STAGES OF THE PACIFIC COAST TICK *DERMACENTOR OCCIDENTALIS* NEUM. (IXODIDAE)[1]

By Glen M. Kohls, *Assistant Entomologist, United States Public Health Service*

Dermacentor occidentalis is the common wood tick of the Pacific Coast region. In Oregon it is found west of the Cascade Mountains, the most northerly point of collection being near Yachats, Lincoln County.[2] In California it is found in most of the wooded regions of the State west of the summit of the Sierra Nevada Mountains, but is apparently absent from the northeast portion comprising all or part of the counties of Siskiyou, Modoc, Shasta, Lassen, Tehama, Butte, Plumas, Sierra, and Nevada.

This tick may prove to be of considerable importance as a vector of diseases of man and animals. Parker, Brooks, and Marsh (*1*) demon-

[1] Contribution from the Rocky Mountain Laboratory, United States Public Health Service, Hamilton, Mont.

[2] Record by Dr. W. J. Chamberlin, Corvallis, Oreg.

strated the occurrence of *Bacterium tularense* in adult ticks taken from cattle in San Benito County, Calif., and since that time *tularense*-infected specimens have been repeatedly collected in California and Oregon by staff members of the Rocky Mountain Laboratory. Though ticks of this species naturally infected with Rocky Mountain spotted fever have not been found, Parker, Philip, and Jellison (*2*) proved it to be an efficient vector under experimental conditions, and epidemiological data suggest that it is a vector for human cases of this disease occurring within its range of distribution. Herms and Howell (*3*) reported experimental transmission of bovine anaplasmosis by larval and nymphal *occidentalis* and suggested that this tick is the important vector of bovine anaplasmosis in California.

Hooker, Bishopp, and Wood (*4*) list the following animals as hosts of the adult ticks: Cattle, horse, man, deer, mule, dog, ass, rabbit, and sheep. As to hosts of immature stages, little information has been available. Because of the recovery of *Bact. tularense* from adult ticks, Parker, Philip, and Jellison (*2*) have suggested that the larval and nymphal ticks would be found to infest small mammals. Wherry and Wellman (*5*) report the finding of ticks identified by Mr. Nathan Banks as *D. occidentalis* on California ground squirrels (*Citellus beecheyi*). Herms and Howell ((*3*) and by correspondence) report the finding of immature stages on cattle.

During the period of May 5 to October 13, 1935, and from April 17 to August 15, 1936, studies on the life history and host relationships of this tick were carried on in Oregon and California by members of the staff of the Rocky Mountain Laboratory. In 1935 the field work was conducted in the region of Grants Pass, Josephine County, Oregon, by two enrollees of the Civilian Conservation Corps, under supervision of Entomologist R. A. Cooley. Work in 1936 was conducted by the writer in the Grants Pass (Oregon) area and in the following areas in California: Los Gatos, Santa Clara County; Pine Knot and Seven Oaks in San Bernardino County; Vista, San Diego County; San Juan Hot Springs, Orange County; Fillmore, Ventura County; Kernville, Kern County; Fairview, Tulare County; Santa Margarita, San Luis Obispo County; Oakland, Alameda County; and Willits, Mendocino County.

The results reported in this paper are limited to the data obtained on the natural hosts of the immature stages of this tick. Immature ticks were obtained by shooting and trapping small mammals, and the examination of livestock and other animals as opportunity afforded. Since it is impractical to make specific identifications of the immature forms, the ticks were forwarded to the Hamilton Laboratory where as many as possible were reared to the adult stage. Because of the fact that many ticks died in transit or could not be induced to feed on

laboratory animals and later died, only part of the larvae and nymphs obtained were reared to the adult stage. Adult ticks were collected wherever possible by "dragging".[3]

OREGON DATA

A list of the Oregon animals examined in 1935, the number examined, number infested, percentage infested, number of larvae and nymphs per host species, average number of ticks per infested animal, and the number of adult ticks reared from the immature ticks collected from each host species are presented in table 1. An approximate total of 2,425 immature *Dermacentor* ticks were collected, from which 833 adults were reared. All proved to be *D. occidentalis*. These ticks were from the following hosts: Douglas ground squirrels, *Citellus douglasii;* wood rats, *Neotoma cinerea* and *fuscipes*; chipmunks, *Eutamias townsendii;* brush rabbits, *Sylvilagus bachmani;* gray squirrels, *Sciurus griseus;* deer mice, *Peromyscus* sp., and coyote, *Canis* sp. Immature *Dermacentors* none of which were reared to the adult stage were collected from jack rabbits, *Lepus californicus*, and chickarees, *Sciurus douglasii.* That these ticks were also *occidentalis* is indicated by the foregoing results and rearing records and by the fact that the collection of a total of 682 adult ticks in the area by dragging and from livestock in 1935 and about 1,000 adults by dragging in 1936 yielded no other species of this genus.

Excluding the single coyote and the 3 gray squirrels, the percentage of infested animals among those examined was greatest in the case of brush rabbits. Seven of the 8 examined (87.5 percent) carried ticks. The number of ticks per animal, 22+, was also the largest found. Second in importance were ground squirrels. Of 169 specimens examined, 140 (82.8 percent) were infested and averaged 14 ticks each. Of 27 wood rats examined 18 (66.6 percent) were infested and averaged 12.5 ticks each.

Animal species on which no immature ticks were found, and the number of each species examined were as follows: 1 spotted skunk, *Spilogale phenax*, 2 shrews, *Sorex* sp., 2 deer, *Odocoileus* sp., 1 dog, *Canis familiaris*, 3 horses, and 2 burros.

CALIFORNIA DATA

A summary of collection and rearing data for California in 1936 is given in table 2. As with the immature ticks collected in Oregon in 1935, many of the ticks, particularly larvae, died in transit to Hamilton. Others refused to reattach on laboratory animals and subsequently died. Of a total of 1,863 immature *Dermacentor* ticks collected, 147 were reared to the adult stage. All were *D. occidentalis*.

[3] Sweeping a yard-square piece of white canton flannel, to which ticks readily cling, over vegetation.

TABLE 1.—*Natural host data—Immature stages Dermacentor occidentalis, Grants Pass, Josephine County, Oreg., 1935*

Animal species: Common name	Animal species: Scientific name	Number examined	Number infested	Percent infested	Larvae	Nymphs	Average per infested animal	Adults reared from immature stages
Douglas ground squirrel	*Citellus douglasii*	169	140	82.8	343	1,617	14.0	690
Wood rat	*Neotoma cinerea* and *fuscipes*	27	18	66.6	32	193	12.5	88
Chipmunk	*Eutamias townsendii*	77	25	32.4	18	12	1.2	2
Brush rabbit	*Sylvilagus bachmani*	8	7	87.5	Few	160	22±	45
Jack rabbit	*Lepus californicus*	5	3	60.0	3	5	2.6	0
Chickaree	*Sciurus douglasii*	33	1	3.0	2	0	2.0	0
Gray squirrel	*Sciurus griseus*	3	3	100.0	0	11	3.6	5
Mouse	*Peromyscus* sp. (principally)	101	14	13.8	2	24	1.8	2
Coyote	*Canis* sp.	1	1	100.0	0	3	3.0	1
Spotted skunk	*Spilogale phenax*	1	0					
Shrew	*Sorex* sp.	2	0					
Deer	*Odocoileus* sp.	2	0					
Horse	*Equus caballus*	3	0					
Burro		2	0					
Dog	*Canis familiaris*	1	0					

TABLE 2.—*Natural host data—Immature stages Dermacentor occidentalis, California, 1936*

Animal species: Common name	Animal species: Scientific name	Number examined	Number infested	Percent infested	Larvae	Nymphs	Average per infested animal	Adults reared from immature stages
California ground squirrel	*Citellus beecheyi*	276	163	59.0	407	617	6.2	95
Douglas ground squirrel	*Citellus douglasii*	33	31	93.9	108	114	7.1	0
Wood rat	*Neotoma lepida* and *fuscipes*	122	57	46.7	161	93	4.4	10
Chipmunk	*Eutamias* sp.	10	4	40.0	3	3	1.5	1
Brush rabbit	*Sylvilagus bachmani*	5	2	40.0	40	10	25.0	3
Cottontail	*Sylvilagus audubonii*	17	12	70.5	8	74	6.8	13
Jack rabbit	*Lupus californicus*	10	6	60.0	6	11	2.8	1
Gray squirrel	*Sciurus griseus*	1	1	100.0	0	1	1.0	0
Deer mouse	*Peromyscus* sp.	110	35	31.8	78	28	3.0	12
Mouse	Not known	27	2	7.4	22	0	11.0	0
Pocket mouse	*Perognathus* sp.	24	13	54.1	7	29	2.7	10
House mouse	*Mus musculus*	6	1	16.6	0	1	1.0	1
Harvest mouse	*Reithrodontomys* sp.	2	0					
Field mouse	*Microtus californicus*	1	0					
Kangaroo rat	*Dipodomys* sp.	3	1	33.3	7	5	12.0	0
Golden mantled ground squirrel	*Callospermophilus chrysodeirus*	15	1	6.6	0	1	1.0	0
Antelope ground squirrel	*Ammospermophilus leucurus*	8	0					
Shrew	*Sorex* sp.	2	0					
Spotted skunk	*Spilogale gracilis*	6	3	50.0	2	25	9.0	0
Horse	*Equus caballus*	17	1	5.8	0	1	1.0	1
Dog	*Canis familiaris*	3	0					
Man	*Homo sapiens*					1		0

Adults were reared from immature ticks collected from the following hosts: California ground squirrels, *Citellus beecheyi;* wood rats, *Neotoma lepida* and *fuscipes;* chipmunk, *Eutamias* sp.; brush rabbits, *Sylvilagus bachmani;* cottontails, *Sylvilagus audubonii;* jack rabbit, *Lepus californicus;* deer mice, *Peromyscus* sp.; pocket mice, *Perognathus* sp.; house mouse, *Mus musculus;* and horse. Collections of immature *Dermacentors* were made from the following hosts but were not reared to the adult stage: Douglas ground squirrels, *Citellus douglasii;* gray squirrel, *Sciurus griseus;* mice, species unknown; kangaroo rats, *Dipodomys* sp.; golden mantled ground squirrel, *Callospermophilus chrysodeirus;* spotted skunk, *Spilogale gracilis;* and man. There can be little doubt that these ticks were also *occidentalis* since 3,218 adult ticks were collected by dragging and from horses, and no species of this genus other than a single specimen of *variabilis* was taken.

Excluding the one gray squirrel examined, which carried only 1 tick, the greatest percentage of infestation was found among Douglas ground squirrels, 31 of 33 examined (93.9 percent) being infested. All of these squirrels were taken in one restricted area near Willits, Mendocino County, and the high percentage of infested animals might well be due to local conditions. Next were cottontail rabbits, of which 12 of 17 (70.5 percent) carried ticks. Third in order were jack rabbits with 6 of 10 animals examined (60.0 percent) serving as tick hosts. One *D. occidentalis* adult was reared from 17 larvae and nymphs collected from this host species, but large numbers of the adults of the rabbit *Dermacentor, D. parumapertus,* were found on all of these animals, and it appears probable that immature stages of this species were also represented among the larvae and nymphs collected. An infestation of 59.0 percent was observed among 276 California ground squirrels, there being 163 infested animals found. The 6 spotted skunks, 3 of which were infested, were all collected in the Oakland (Alameda County) area, in the same vicinity. Of 122 wood rats examined, 57 (46.7 percent) were infested. Four of 10 chipmunks and 2 of 5 brush rabbits, or 40 percent of each species, were infested. A single engorged nymph was collected from 1 of 17 horses examined in the Oakland area. A single nymph was found attached to the writer's arm.

Animal species on which no immature ticks were found and the number of each species examined were as follows: Two harvest mice, *Reithrodontomys* sp.; one field mouse, *Microtus californicus;* eight antelope ground squirrels, *Ammospermophilus leucurus;* two shrews, *Sorex* sp.; and three dogs, *Canis familiaris.*

The highest average number of ticks per animal was 25, on 2 brush rabbits, next 12, representing a single infested kangaroo rat of a total of 3 examined. Among the host species of which 4 or more infested

animals were found, the largest average number of ticks per infested animal occurred among Douglas ground squirrels, 7.1, next cottontails, 6.8, and third California ground squirrels, 6.2. Wood rats ranked fourth with 4.4.

DISCUSSION

From the foregoing data it is apparent that a wide variety of animals serve as hosts of the immature stages of *D. occidentalis.* Adult ticks were reared from immature stages collected from the following animals: *Citellus douglasii, Citellus beecheyi, Neotoma cinerea, lepida* and *fuscipes, Eutamias* sp., *Sylvilagus bachmani, Sylvilagus audubonii, Lepus californicus, Sciurus griseus; Peromyscus* sp., *Perognathus* sp., *Mus musculus, Canis* sp. (coyote), and horse. *Dermacentor* sp. larvae and nymphs, probably all *occidentalis* but not reared through to the adult stage, were collected from the following animals: *Sciurus douglasii, Dipodomys* sp., *Callospermophilus chrysodeirus, Spilogale gracilis,* "mouse", and man. With the record by Herms and Howell (*3*) of the finding of larvae and nymphs on cattle, the above list includes the known hosts of these stages. Had it been possible to make specific determinations of all host animals, the list would undoubtedly have been extended.

The following native animals, because of their abundance and general distribution in tick-infested regions, are of major importance as larval and nymphal tick hosts: Ground squirrels, *Citellus douglasii* and *C. beecheyi* in their respective ranges, and deer mice, *Peromyscus* spp. The following listed animals not so generally distributed, but often locally abundant, are also of importance: Wood rats, *Neotoma* spp.; brush rabbits, *Sylvilagus bachmani;* cottontails, *Sylvilagus audubonii;* jack rabbits, *Lepus californicus;* pocket mice, *Perognathus* sp.; and chipmunks, *Eutamias* sp.

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DEATHS DURING WEEK ENDED MAR. 27, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 27, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9, 302	10, 192
Average for 3 prior years	9, 282	
Total deaths, first 12 weeks of year	123, 390	118, 392
Deaths under 1 year of age	595	674
Average for 3 prior years	615	
Deaths under 1 year of age, first 12 weeks of year	7, 583	7, 052
Data from industrial insurance companies:		
Policies in force	69, 556, 759	68, 251, 415
Number of death claims	14, 220	14, 510
Death claims per 1,000 policies in force, annual rate	10. 7	11. 1
Death claims per 1,000 policies, first 12 weeks of year, annual rate	11. 5	11. 1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 3, 1937, and Apr. 4, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936
New England States:								
Maine			1	13	15	195	0	1
New Hampshire	1				53	35	0	0
Vermont	1	1			2	799	0	0
Massachusetts	3	4			632	1,109	11	13
Rhode Island	1				296	48	1	0
Connecticut	2	1	13	24	707	50	1	2
Middle Atlantic States:								
New York	27	57	[1] 22	[1] 17	776	2,909	8	21
New Jersey	19	13	19	26	3,728	324	3	5
Pennsylvania	43	31			595	721	11	14
East North Central States:								
Ohio	25	28	20	20	584	424	8	7
Indiana	10	11	312	116	137	28	7	6
Illinois	45	43	59	61	106	24	4	10
Michigan	10	11	2	12	78	110	2	4
Wisconsin	1	2	74	69	19	111	0	1
West North Central States:								
Minnesota	8	7	1		47	301	1	2
Iowa	7	8	8	5	3	2	1	1
Missouri	11	24	110	967	41	23	0	6
North Dakota			3	12			0	0
South Dakota		2			4	1	0	0
Nebraska	2	5		4	9	108	2	1
Kansas	4	15	8	81	15	9	1	1
South Atlantic States:								
Delaware	9	6			81	21	1	1
Maryland [2]	15	6	28	30	934	292	10	9
District of Columbia	11	11		1	69	45	2	7
Virginia	9	7		909	217	151	15	10
West Virginia	5	6	67	229	8	30	8	9
North Carolina [3]	9	18	69	107	168	64	4	10
South Carolina	4	2	707	303	38	17	1	8
Georgia [3]	4	10	336	657			2	3
Florida	4	3	35	12	5	18	12	1
East South Central States:								
Kentucky	8	8	17	202	151	77	13	48
Tennessee	11	6	132	552	24	70	14	10
Alabama [3]	5	17	674	1,823	9	50	17	7
Mississippi [2]	2	4					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 3, 1937, and Apr. 4, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936
West South Central States:								
Arkansas	1	9	129	367	4	7	0	3
Louisiana	16	9	68	606	164	67	0	3
Oklahoma [4]	4	23	162	323	26	21	1	9
Texas [3]	42	42	1,157	902	624	423	12	8
Mountain States:								
Montana	1		26	39	8	15	0	2
Idaho	1			4	18	15	3	0
Wyoming [5]					3		1	0
Colorado	5	10			4	25	0	2
New Mexico	4	3	3	85	120	54	3	0
Arizona		1	55	90	200	135	1	1
Utah [2]				3	24	21	0	0
Pacific States:								
Washington	1	2		57	51	362	4	1
Oregon [5]	1	1	36	93	9	269	0	2
California	22	26	417	351	136	2,640	8	7
Total	414	493	4,770	9,172	11,041	12,280	180	256
First 13 weeks of year	6,774	7,775	255,661	106,460	81,722	113,928	2,208	3,120

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936
New England States:								
Maine	0	2	27	7	0	0	0	4
New Hampshire	0	0	10	9	0	0	0	2
Vermont	0	0	7	12	0	0	0	0
Massachusetts	0	0	287	368	0	0	0	2
Rhode Island	0	0	55	25	0	0	0	0
Connecticut	0	0	142	102	0	0	2	5
Middle Atlantic States:								
New York	1	1	941	1,159	0	0	3	9
New Jersey	1	0	272	522	0	0	3	2
Pennsylvania	0	0	1,134	639	0	0	5	7
East North Central States:								
Ohio	0	0	331	463	0	0	2	39
Indiana	0	0	241	264	3	5	1	0
Illinois	2	1	861	885	67	8	0	10
Michigan	1	0	701	347	13	0	2	8
Wisconsin	0	1	304	557	2	9	1	1
West North Central States:								
Minnesota	0	0	158	383	4	5	1	0
Iowa	0	0	202	221	40	30	1	2
Missouri	0	0	275	115	62	7	0	2
North Dakota	0	0	20	55	0	3	1	4
South Dakota	0	0	76	77	2	27	0	0
Nebraska	0	0	87	213	8	34	0	0
Kansas	0	0	346	302	36	35	0	0
South Atlantic States:								
Delaware	0	0	7	3	0	0	0	0
Maryland [3]	1	1	58	60	0	0	2	4
District of Columbia	0	0	8	16	0	0	0	1
Virginia	2	0	20	51	0	0	4	8
West Virginia	1	0	70	55	0	0	4	2
North Carolina [3]	0	1	30	32	0	4	8	4
South Carolina	0	0	5	2	0	0	2	0
Georgia [3]	1	0	9	15	0	0	3	0
Florida	2	0	8	7	0	0	1	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 3, 1937, and Apr. 4, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936	Week ended Apr. 3, 1937	Week ended Apr. 4, 1936
East South Central States:								
Kentucky	3	0	57	43	0	1	9	4
Tennessee	1	0	27	20	0	0	2	9
Alabama [3]	0	0	9	7	0	1	3	0
Mississippi [2]	1	1	10	6	0	0	0	0
West South Central States:								
Arkansas	0	0	11	18	0	0	0	2
Louisiana	0	0	13	10	1	0	10	2
Oklahoma [4]	0	0	22	36	1	0	2	6
Texas [3]	4	0	138	59	2	5	13	2
Mountain States:								
Montana	0	0	27	101	14	6	0	0
Idaho	1	0	18	53	3	4	1	0
Wyoming [5]	1	0	33	67	7	3	0	0
Colorado	0	0	41	193	16	10	1	0
New Mexico	1	0	34	90	1	0	0	0
Arizona	1	0	5	23	0	0	0	2
Utah [2]	0	0	19	71	0	1	0	0
Pacific States:								
Washington	0	0	34	106	10	5	5	1
Oregon [5]	2	1	36	43	12	4	1	8
California	3	1	203	338	9	2	5	0
Total	30	10	7,609	8,319	328	209	98	148
First 13 weeks of year	280	226	88,382	103,532	3,082	2,873	1,406	1,376

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 3, 1937, 27 cases, as follows: North Carolina, 1; Georgia, 8; Alabama, 10; Texas, 8.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 3, 1937, 3 cases, as follows: Wyoming, 1; Oregon, 2.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1936										
Colorado		28	74		26		3	223	16	2
February 1937										
Alabama	18	74	4,233	100	38	11	3	60	6	9
Virginia	34	75	15,147	4	861	3	2	135	1	10
March 1937										
District of Columbia	9	52	20		389		1	56	0	1
Nebraska	3	10	27		25		1	324	39	0
North Carolina	20	64	956		593	22	2	167	1	11

Summary of monthly reports from States—Continued

December 1936

	Cases
Colorado:	
Chicken pox	302
Dysentery (bacillary)	2
Impetigo contagiosa	1
Jaundice	12
Mumps	32
Septic sore throat	7
Trachoma	8
Vincent's infection	1
Whooping cough	239

February 1937

	Cases
Chicken pox:	
Alabama	143
Virginia	203
Dysentery:	
Alabama (amoebic)	1
Virginia (diarrhea included)	36
Encephalitis, epidemic or lethargic:	
Alabama	4
Virginia	1
German measles:	
Alabama	2

February 1937—Continued

	Cases
Mumps:	
Alabama	186
Virginia	294
Ophthalmia neonatorum:	
Virginia	1
Paratyphoid fever:	
Virginia	1
Rabies in animals:	
Alabama	78
Rocky Mountain spotted fever:	
Virginia	1
Septic sore throat:	
Virginia	11
Tetanus:	
Alabama	2
Tularaemia:	
Alabama	2
Virginia	3
Typhus fever:	
Alabama	8
Undulant fever:	
Alabama	2
Virginia	1
Whooping cough:	
Alabama	121
Virginia	271

March 1937

	Cases
Chicken pox:	
District of Columbia	176
Nebraska	106
North Carolina	819
German measles:	
North Carolina	700
Mumps:	
Nebraska	160
Ophthalmia neonatorum:	
North Carolina	2
Paratyphoid fever:	
North Carolina	1
Septic sore throat:	
Nebraska	10
North Carolina	10
Tularaemia:	
North Carolina	1
Typhus fever:	
North Carolina	3
Undulant fever:	
Nebraska	1
North Carolina	3
Whooping cough:	
District of Columbia	37
Nebraska	41
North Carolina	542

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 27, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	233	534	129	7,370	948	2,728	23	421	23	1,503	
Current week [1]	141	386	103	3,108	930	2,471	41	391	13	1,364	
Maine:											
Portland	0		0	0	3	4	0	0	0	11	22
New Hampshire:											
Concord	0		0	0	0	0	0	0	0	0	8
Manchester	0		0	3	0	12	0	0	0	0	19
Nashua	0		0	7	0	0	0	0	0	0	6
Vermont:											
Barre											
Burlington	0		0	0	0	0	0	0	0	0	16
Rutland	0		0	0	1	3	0	0	0	0	7
Massachusetts:											
Boston	0		4	13	35	70	0	5	0	127	269
Fall River	0		1	23	3	5	0	1	0	7	36
Springfield	0		0	7	4	3	0	1	0	32	32
Worcester	1		0	165	5	9	0	3	0	41	52
Rhode Island:											
Pawtucket	0		0	1	0	1	0	0	0	0	18
Providence	0	1	0	205	7	34	0	5	1	30	68
Connecticut:											
Bridgeport	0		0	20	3	60	0	4	0	0	30
Hartford	0		0	3	5	3	0	0	0	0	48
New Haven	0	1	0	2	2	7	0	2	0	0	51
New York:											
Buffalo	0		1	85	14	30	0	1	0	40	157
New York	39	32	11	298	203	469	0	83	3	57	1,738
Rochester	1	1	0	1	7	8	0	1	0	15	63
Syracuse	0		0	4	6	49	0	0	0	30	50
New Jersey:											
Camden	1	1	1	0	6	2	0	0	0	1	18
Newark	0	6	1	748	20	25	0	3	0	16	114
Trenton	0		0	0	4	5	0	1	0	0	35

[1] Figures for Barre and Topeka estimated; current reports not received.

City reports for week ended Mar. 27, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Pennsylvania:											
Philadelphia	8	10	7	17	46	246	0	22	0	41	531
Pittsburgh	5	6	5	43	20	45	0	4	0	28	150
Reading	0	------	0	41	7	13	0	2	0	12	31
Scranton	0	------	------	1	------	22	0	------	0	0	------
Ohio:											
Cincinnati	2	5	0	103	17	17	0	12	0	5	157
Cleveland	0	30	3	50	24	49	0	8	0	47	231
Columbus	1	3	3	3	6	8	0	3	0	15	97
Toledo	1	3	3	65	2	5	0	3	0	36	67
Indiana:											
Anderson	0	------	1	3	3	10	0	0	0	1	11
Fort Wayne	1	------	0	1	5	0	1	0	0	7	26
Indianapolis	2	------	2	48	15	46	0	7	0	29	111
Muncie	0	4	0	0	6	2	0	0	0	1	17
South Bend	0	------	0	1	0	0	0	0	0	0	13
Terre Haute	2	------	0	0	0	0	0	0	0	1	17
Illinois:											
Alton	0	------	1	0	1	10	0	0	0	3	5
Chicago	10	16	6	39	57	255	0	40	0	55	692
Elgin	1	------	0	0	2	0	0	0	0	7	13
Moline	0	1	0	0	0	0	0	0	0	6	12
Springfield	0	------	0	0	3	4	0	0	0	11	27
Michigan:											
Detroit	3	1	1	13	31	445	0	16	0	65	275
Flint	0	------	0	0	5	26	0	1	1	3	39
Grand Rapids	0	------	0	13	2	11	0	1	0	13	38
Wisconsin:											
Kenosha	0	------	0	1	0	2	0	0	0	5	14
Madison	0	------	0	3	1	2	0	0	0	4	17
Milwaukee	1	2	2	5	10	60	0	7	1	22	115
Racine	0	------	0	1	1	7	0	1	0	0	12
Superior	0	------	1	0	0	2	0	0	0	8	11
Minnesota:											
Duluth	0	------	0	0	0	0	0	1	0	4	20
Minneapolis	1	------	2	0	3	14	0	3	1	11	100
St. Paul	0	------	0	0	2	16	4	0	0	83	47
Iowa:											
Cedar Rapids	0	------	------	0	------	2	0	------	0	0	------
Davenport	0	------	------	0	------	3	0	------	0	0	------
Des Moines	0	------	------	0	------	39	1	------	0	0	41
Sioux City	0	------	------	0	------	13	0	------	0	1	------
Waterloo	2	------	0	1	------	20	0	------	0	18	------
Missouri:											
Kansas City	1	2	2	0	14	102	0	0	0	4	100
St. Joseph	0	------	1	0	2	17	26	1	0	0	29
St. Louis	10	------	4	1	26	80	3	6	0	89	200
North Dakota:											
Fargo	0	------	0	0	0	6	2	2	0	0	8
Grand Forks	0	------	------	0	------	0	2	------	0	4	------
Minot	0	------	------	0	0	3	0	0	0	0	5
South Dakota:											
Aberdeen	0	------	------	0	------	5	0	------	0	0	------
Nebraska:											
Omaha	0	------	0	0	4	8	1	3	0	6	73
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	4	4
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	------	0	13	6	6	0	0	0	4	28
Delaware:											
Wilmington	0	------	0	10	4	2	0	0	0	0	31
Maryland:											
Baltimore	0	14	4	701	29	18	0	14	0	41	244
Cumberland	0	1	0	1	1	0	0	0	0	0	15
Frederick	0	------	0	11	0	0	0	0	0	0	6
Dist. of Columbia:											
Washington	10	1	0	114	11	14	0	10	0	9	170
Virginia:											
Lynchburg	8	------	0	1	3	1	0	1	0	10	13
Norfolk	1	------	1	7	6	4	0	1	0	1	39
Richmond	0	------	1	5	7	3	0	2	1	0	61
Roanoke	0	------	0	108	3	0	0	1	0	5	17
West Virginia:											
Charleston	0	------	0	1	4	0	0	0	0	7	27
Huntington	0	------	------	1	------	0	0	------	0	0	------
Wheeling	1	------	1	1	1	0	0	0	0	4	48

City reports for week ended Mar. 27, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	0	------	0	0	2	1	0	2	0	0	19
Wilmington	0	------	0	0	2	0	0	0	0	0	17
Winston-Salem	0	------	1	0	5	2	0	1	0	0	17
South Carolina:											
Charleston	2	49	1	1	7	2	0	0	0	0	26
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	1	------	0	0	4	0	0	0	0	0	12
Greenville	0	------	0	0	1	0	0	1	0	4	6
Georgia:											
Atlanta	5	64	1	1	18	7	0	7	0	1	93
Brunswick	0	1	1	1	2	0	0	0	0	3	7
Savannah	0	34	2	0	3	1	0	4	0	4	34
Florida:											
Miami	0	6	2	2	3	0	0	3	1	0	49
Tampa	1	1	1	1	4	2	0	0	1	0	32
Kentucky:											
Ashland	0	6	1	1	0	0	0	0	0	0	2
Covington	0	------	1	4	8	4	0	2	0	1	25
Lexington	0	5	0	5	5	0	0	1	0	15	23
Louisville	3	------	0	3	17	11	0	7	16	0	109
Tennessee:											
Knoxville	0	2	2	0	3	0	0	1	1	0	21
Memphis	0	------	1	2	20	4	0	5	0	11	91
Nashville	0	------	1	0	5	2	0	1	0	3	55
Alabama:											
Birmingham	1	59	4	0	17	5	0	5	0	2	120
Mobile	5	2	2	0	7	2	0	2	0	0	34
Montgomery	1	4	------	0	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	0	0	------	0	0	------
Little Rock	1	------	0	1	0	7	0	0	0	0	------
Louisiana:											
Lake Charles	0	------	0	0	0	0	0	0	0	0	1
New Orleans	8	16	6	3	22	1	0	10	0	2	170
Shreveport	1	------	0	1	13	0	0	1	0	1	54
Oklahoma:											
Muskogee	0	------	------	0	------	3	0	------	0	0	------
Oklahoma City	0	7	0	0	6	8	0	0	0	0	41
Tulsa	0	------	------	2	------	5	0	------	0	5	------
Texas:											
Dallas	3	3	3	41	7	14	0	5	0	11	68
Fort Worth	0	------	1	63	5	8	0	1	0	4	35
Galveston	0	------	0	0	4	1	0	2	0	4	22
Houston	5	------	3	1	12	6	0	7	1	21	96
San Antonio	0	------	1	15	6	2	0	10	0	2	66
Montana:											
Billings	0	------	0	0	1	2	0	0	0	0	5
Great Falls	0	------	0	0	1	2	0	0	0	3	8
Helena	0	------	0	7	2	4	0	0	0	0	4
Missoula	0	------	0	0	0	0	1	0	0	0	5
Idaho:											
Boise	0	------	0	0	2	1	0	0	0	0	2
Colorado:											
Colorado Springs	0	------	0	0	0	7	0	1	0	0	14
Denver	2	------	2	5	8	18	0	3	0	41	84
Pueblo	0	------	0	0	0	1	0	0	0	1	7
Utah:											
Salt Lake City	0	------	1	12	2	7	0	1	0	21	42
Nevada:											
Reno	------	------	------	------	------	------	------	------	------	------	------
Washington:											
Seattle	0	------	2	5	8	4	0	5	0	29	92
Spokane	0	------	0	3	3	3	0	0	1	2	38
Tacoma	0	------	0	0	0	3	0	1	0	1	28
Oregon:											
Portland	0	------	1	2	9	8	2	4	0	4	85
California:											
Los Angeles	4	20	3	20	30	29	3	21	1	97	402
Sacramento	0	------	0	4	9	12	0	1	0	2	37
San Francisco	0	4	2	4	8	14	0	17	0	34	183

City reports for week ended Mar. 27, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
New York:			
New York	12	4	0
New Jersey:			
Newark	1	0	0
Pennsylvania:			
Philadelphia	0	1	0
Ohio:			
Cincinnati	1	0	0
Illinois:			
Chicago	2	0	0
Michigan:			
Detroit	1	0	0
Grand Rapids	1	1	0
Minnesota:			
Minneapolis	1	0	0
St. Paul	1	0	0
Iowa:			
Des Moines	1	0	0
Missouri:			
Kansas City	1	0	0
St. Joseph	0	1	0
Maryland:			
Baltimore	5	0	0
District of Columbia:			
Washington	2	1	0
Virginia:			
Richmond	3	2	0
West Virginia:			
Wheeling	1	1	0
Georgia:			
Savannah	1	0	0
Florida:			
Miami	1	0	0
Kentucky:			
Ashland	1	0	0
Tennessee:			
Knoxville	2	1	0
Memphis	2	0	0
Nashville	1	1	0
Alabama:			
Birmingham	8	4	0
Arkansas:			
Little Rock	1	0	0
Texas:			
Houston	1	0	0
Colorado:			
Denver	0	1	0
Washington:			
Spokane	1	0	0
Tacoma	1	0	0
California:			
Los Angeles	1	2	0
San Francisco	0	0	1

Dengue.—Cases: Charleston, S. C., 2.
Encephalitis, epidemic or lethargic.—Cases: New York, 1; Muncie, 1; Dallas, 1.
Pellagra.—Cases: Chicago, 1; Raleigh, 1; Charleston, S. C., 1; Atlanta, 2; Savannah, 6; Dallas, 1.
Typhus fever.—Cases: Atlanta, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 13, 1937.—During the 2 weeks ended March 13, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	2		1	1		5
Chicken pox		8	2	195	591	56	54	17	41	964
Diphtheria		5	5	32	12	5	3			62
Dysentery				1						1
Erysipelas				6	10	4	7	6	11	44
Influenza	1	1,070	818	4,929	3,002	5	365		530	10,810
Lethargic encephalitis					2		1			3
Measles		19	74	598	945	98	849	164	782	3,529
Mumps		16	20		833	24	41	102	87	1,132
Pneumonia	1	9			102		13		4	129
Poliomyelitis							1			1
Scarlet fever		14	6	119	258	87	83	99	38	734
Trachoma							7		5	12
Tuberculosis	4	15	21	66	128	24	30	4	23	315
Typhoid fever				11	6				2	19
Undulant fever					4				1	5
Whooping cough		24	2	154	206	48	76	12	14	536

NOTE.—No report was received from Quebec for the week ended Mar. 6, 1937.

ITALY

Communicable diseases—4 weeks ended January 31, 1937.—During the 4 weeks ended January 31, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Jan. 4-10		Jan. 11-17		Jan. 18-24		Jan. 25-31	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	13	11	8	8	15	15	9	9
Cerebrospinal meningitis	26	21	28	23	32	27	36	28
Chicken pox	482	168	462	167	406	183	398	162
Diphtheria and croup	540	209	546	305	564	312	538	293
Dysentery	12	8	6	6	5	5	5	5
Hookworm disease	2	2	3	3	3	3	12	5
Lethargic encephalitis			2	2			1	1
Measles	1,287	210	1,358	259	1,428	260	1,656	300
Mumps	343	101	386	118	348	100	434	117
Paratyphoid fever	30	26	24	18	32	25	31	25
Poliomyelitis	15	13	10	10	11	9	18	17
Puerperal fever	42	36	46	42	44	38	49	46
Rabies			1	1				
Scarlet fever	260	113	336	133	280	119	331	128
Typhoid fever	204	131	205	123	174	108	167	112
Undulant fever	48	36	46	37	45	36	54	45
Whooping cough	607	150	518	160	571	173	637	198

JAMAICA

Communicable diseases—4 weeks ended March 20, 1937.—During the 4 weeks ended March 20, 1937, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	8	16	Puerperal septicæmia		1
Dysentery	10	5	Scarlet fever	1	2
Erysipelas		1	Tuberculosis	34	75
Leprosy	1	1	Typhoid fever	13	48

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for March 26, 1937, pages 372-385. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued April 30, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Bolivia—Chuquisaca Department.—During the month of February 1937, 5 cases of plague were reported in Chuquisaca Department, Bolivia.

Brazil.—During the month of January 1937, 1 case of plague was reported in Ceara State, and 4 cases of plague with 1 death were reported in Parahyba State, Brazil.

China—Hainan Island.—A report dated March 30, 1937, states that bubonic plague has appeared in the northeastern part of Hainan Island, China.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—A rat found on April 5, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been found plague-infected.

Smallpox

Egypt—Qena Province.—During the week ended March 27, 1937, 1 case of smallpox was reported in Qena Province, Egypt.

Typhus Fever

Arabia—Aden.—During the week ended March 6, 1937, 1 imported case of typhus fever was reported in Aden, Arabia.

Bolivia.—During the month of February 1937, typhus fever was reported in the following Departments of Bolivia: La Paz, 18 cases; Oruro, 6 cases; Potosi, 1 case.

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UNITED STATES TREASURY DEPARTMENT

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THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

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PUBLIC HEALTH REPORTS

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RADIO PRATIQUE

Pratique by Wireless in Lieu of Quarantine Inspection for Passenger Vessels

By C. V. Akin, *Senior Surgeon, United States Public Health Service, Chief Quarantine Officer, Port of New York*

On February 1, 1937, with the approval of the Secretary of the Treasury, there was inaugurated at New York one of the most significant modifications of United States quarantine procedure ever sponsored by the Public Health Service. On that date, for the first time since the institution of the Federal system of maritime quarantine a commercial vessel, after a foreign voyage, legally entered a United States port without being required to undergo quarantine inspection.

Under the new plan, developed by the New York Quarantine Station at the direction of the Surgeon General of the Public Health Service, permission to enter and dock is granted by wireless to certain especially qualified classes of passenger vessels.

Permission for vessels from foreign ports to hold intercourse with domestic ports is called "pratique." As the new system involves the use of a wireless message certifying to the state of health on board the incoming vessel, and pratique is granted by wireless, the term "radio pratique" was adopted to describe the procedure.

The principle of granting pratique on certification in lieu of inspection is not new. In recent years, other countries have adopted modifications of maritime quarantine restrictions which have had the effect of giving vessels the "benefit of the doubt" until a quarantinable condition actually has been demonstrated to exist on board. The Public Health Service has for many years accepted certification, by wireless, of commissioned medical officers of United States Navy vessels and Army transports in lieu of physical inspection at quarantine; but, heretofore, commercial vessels, regardless of their class or of the healthfulness of ports visited, have been required to undergo inspection at the first United States port touched after a foreign voyage.

Owing to the potential infectibility of many of our domestic ports, the United States Government has wisely been slow to lower existing protective barriers until a mechanism which promised at least equal protection could be devised. It is believed that the Public Health Service plan for "radio pratique" fulfills this condition and offers the maximum of safety to our ports while imposing on steamship lines the minimum burden of expense and delay.

In developing the plan, the chief quarantine officer at New York, working in closest harmony with the chief of the Foreign Quarantine Division at Washington, made a comprehensive study of the major factors which would have a direct bearing on the success or failure of any plan suggested to modernize and simplify the quarantine inspection procedure. From the beginning, the study was directed at the development of a procedure which might safely replace the expensive and otherwise burdensome system of inspection which always had been in effect. The endeavor was made more complicated by the fact that the ship entry schedule at New York was predicated on a stop in the quarantine anchorage, during which time many details other than the quarantine inspection were attended to.

Among the items of inquiry were the following:

1. *World health conditions.*—Coupled with this item was the consideration of the eligibility of ports or geographical areas on the basis of the identification of sources of sanitary information. In the final analysis, not to have a constant dependable source of such information in a foreign port was considered to be of the same significance in rejecting a port as if the port were known or suspected to be infected with a quarantinable disease.

2. *The vessels and their medical staffs.*—Only passenger vessels were ever considered for "Radio Pratique."

In developing a list of vessels which might qualify to enter without quarantine inspection, the sanitary history of the vessels as shown in the records of the New York quarantine station was given the greatest weight. Items of chief interest were the general sanitary condition and the rat infestation status of the vessels. These items are rechecked at short intervals by personnel of the New York quarantine station.

The qualifications and abilities of all of the regularly employed ship's physicians were known to the officers at the New York quarantine station, but this knowledge was extended by inquiry during the study. Coincidentally, it was ascertained that a number of passenger vessels did not have whole-time physicians as regular members of their crews.

3. *Infectibility of the Port of New York to quarantinable diseases.*—It is sufficient to state that the Port of New York possesses a high degree of immunity against the successful implantation, in epidemic propor-

tions, of any of the quarantinable diseases. This condition is assured by—

(A) Highly developed sanitary safeguards, and

(B) Efficient operation of a well organized health department, supplemented by hospital facilities which could absorb and control any reasonable number of cases of pestilential disease before the infection could assume epidemic proportions.

PLAN FOR RADIO PRATIQUE

The "Plan for Radio Pratique" as finally worked out and introduced, covers the following basic considerations:

1. *Eligibility of vessels.*—To be eligible for "Radio Pratique", a vessel must conform to *all* of the following requirements:

(A) Engage principally in the carrying of passengers.

(B) Limit "rat-attractive" and "rat-harboring" items of cargo to 25 percent of its dead-weight cargo carrying capacity.

(C) Be in regular scheduled service, on a fixed itinerary, between New York and certain designated ports or geographical areas, and when on "cruise" must not contact ports other than those in designated areas.

(D) Carry as a regular member of the crew a physician, a whole-time employee of the vessel, whose professional qualifications are attested to by documentary evidence acceptable to the chief quarantine officer.

(E) Must visit no port in which a quarantinable disease is known or suspected to have occurred in epidemic proportions within 60 days preceding the visit.

(F) Carry no commercial shipments of birds of the parrot family.

(G) Be relatively free from rats and be maintained in a satisfactory sanitary condition.

(H) A certificate covering items A, B, C, and D, above, must be filed with the chief quarantine officer by the owners or agents who apply for eligibility for a vessel.

2. *Eligibility of ports and geographical areas.*—Only the following listed regular services are at this time approved for vessels eligible for "radio pratique":

(A) Between New York and European ports.

(B) Between New York and the Panama Canal.

(C) Between New York and the west coast of the United States, through the Panama Canal.

(D) Between New York and Bermuda or ports in the West Indies, or seasonal cruises of vessels, regularly in service A, B, or C, above, to ports in Bermuda, the West Indies, or Canadian ports on the Atlantic coast.

The selection of ports rests with the Surgeon General of the Public Health Service, who may, in his discretion, either add to or reduce the extent of the geographical areas which may be visited without loss of eligibility.

3. *Eligibility of ships' physicians.*—In the Public Health Service plan for "radio pratique" full responsibility for protecting United States ports is placed on the ship's physician. In effect, he becomes a supplementary quarantine officer, for upon him devolves the function formerly carried on by the port medical officer who inspected the vessel when it was required to stop at quarantine.

The ship's physician must be qualified to diagnose the eight quarantinable diseases in which the Public Health Service is interested and the several communicable nonquarantinable diseases for which the health department of the city of New York feels particular concern.

His professional qualifications must be evidenced by medical diploma and certificates of license and registration, and his employment status must be vouched for by the owners or agents of the vessel on which he is employed.

He must have a keen sense of his responsibility to the quarantine station which accepts his word as to health conditions on board the incoming vessel and he must loyally and faithfully fulfill his trust. He must not forget his obligation to the vessel on which he serves, as any error or failure on his part will result in the immediate loss of its eligibility for "radio pratique."

Supplementing the examination of the ship's physician.—A further safeguard is provided by the fact that the medical officer of the Public Health Service who boards the incoming vessel before it reaches the dock, for immigration inspections, personally inspects all persons reported ill by the ship's physician. Should any person manifest signs suggesting a quarantinable disease, the chief quarantine officer would be notified, and, if inspection confirmed the presence of a quarantinable disease, appropriate treatment would be applied before passengers or members of the crew would be permitted to go ashore.

PROCEDURE OF RADIO PRATIQUE AT NEW YORK

A list of vessels eligible for "radio pratique" is maintained by the chief quarantine officer. Vessels whose names appear on the list are certified as eligible to the New York agents and to all governmental agencies, such as the Customs and Immigration Services and the Post Office Department.

Eligible vessels may, not more than 24 hours nor less than 12 hours before their expected arrival at New York, apply by wireless through the New York agents to the chief quarantine officer, giving all required information regarding the sanitary status of the vessel and the health of its passengers and crew. When the application is

approved, a wireless message confirming the fact goes from the chief quarantine officer to the vessel through the agents.

The vessel may then proceed direct to its dock without quarantine inspection, provided that at the time it reaches quarantine, health conditions on board remain satisfactory.

As soon as the vessel docks, a written statement, signed by the master and ship's physician, confirming the statements made by them in the wireless application for "radio pratique", is forwarded to the chief quarantine officer.

Should cases of communicable nonquarantinable disease occur on board, the vessel is required to report by wireless direct to the city department of health and subsequently on docking to comply with all directions given by the city health commissioner.

The utilization of the privilege of "radio pratique" is entirely discretionary with the vessel. Having received pratique by wireless, the vessel may proceed direct to its dock or it may anchor in the quarantine anchorage until it suits its convenience to dock. If a known or suspected quarantinable disease appears on a vessel after it has received pratique by wireless, it is expected to notify the chief quarantine officer and to stop at quarantine for inspection. Failure to comply with this requirement will result immediately in loss of eligibility, both for the vessel and its medical personnel.

EXTENT OF UTILIZATION OF RADIO PRATIQUE

From February 1 to March 26, 1937, a period of 54 days, a total of 127 vessels availed themselves of the privilege of "radio pratique." As no eligible vessels entered on 8 days, 127 vessels entered on 46 days, giving a daily average of 2.76 vessels.

The following table shows clearly the extent to which the service is utilized:

Number of lines and vessels using radio pratique			Number of times radio pratique used	Number of lines and vessels using radio pratique			Number of times radio pratique used
Nationality	Number of lines	Eligible vessels		Nationality	Number of lines	Eligible vessels	
British	3	22	47	Dutch	1	4	6
American	6	25	36	Polish	1	2	2
German	3	11	18	Norwegian	1	2	1
French	1	5	9				
Italian	1	2	5	Total	18	76	127
Swedish	1	3	3				

SUMMARY

A total of 76 vessels, of 822,308 net tons, belonging to 18 steamship companies under 9 flags used "radio pratique" 127 times in 46 days. The 127 entries with "radio pratique" totaled 1,513,104 net tons and carried 42,438 passengers and 48,973 crew members.

STUDIES ON TRICHINOSIS

II. Some Correlations and Implications in Connection With the Incidence of Trichinae Found in 300 Diaphragms

By MAURICE C. HALL, *Professor of Zoology*, and BENJAMIN J. COLLINS, *Laboratory Aide, Division of Zoology, National Institute of Health, United States Public Health Service*

In the first paper of this series, Hall and Collins (1937) reported the finding of trichinae in 41 diaphragms out of 300 necropsy cases examined, or 13. 67 percent. The diaphragms came from 5 Federal hospitals to which patients come from all parts of the United States, and from 6 Washington hospitals drawing their patients from the population of the capital city, which population, in turn, comes from all parts of the United States and has a relatively small group born and reared in Washington. Such Federal hospitals as those of the Army, Navy, Veterans' Bureau, and the U. S. Public Health Service obviously deal with groups which travel widely over the United States and its possessions, and the general population of Washington travels extensively. Such groups would reflect conditions throughout the country rather than in Washington alone. In connection with the incidence reported by us, we note that Whelpley (1891) says: "The statement has been made that one out of every seven human beings is affected with trichinosis." We do not know the author of the statement, but evidence available at this time suggests that more extensive study may show it to be approximately correct for the population of the United States. By contrast, we note an editorial (1917) in the Medical Summary, in which the editor refers to the "mite" as unreported for years, and says: "If trichinosis is really a myth the profession should know and our literature should be amended accordingly."

Since the Federal hospitals deal with such special groups as military personnel, with the marine personnel of the Navy and merchant marine, and with cases of mental derangement, and since the other Washington hospitals deal with whites alone, Negroes alone, or both, and with children alone in one case and with children and adults in the other cases, representing groups of both high and low economic-social status, we have undertaken to obtain from the hospitals certain data which would enable us to make some tentative correlations between the incidence of trichinae and conditions in the various groups named. The data we have collected cover sex, race, age, military or civil status, association with land or sea, occupation (or parent's occupation in the case of a child) as a basis for economic-social status, and presence or absence of mental derangement associated with prolonged hospitalization. In one case, owing to a misunderstanding,

we obtained no data other than that the diaphragm was from a mentally deranged person. In some cases hospitals could not furnish data as to age, occupation, or other items, and so the total of groups contrasted on any one basis is usually slightly less than 300 cases.

The groups as defined intergrade in such a way that for any one individual they may be highly misleading, but the groups as a whole or on the average are probably sufficiently well defined to make some correlations and general statements possible. Thus, a soldier in the regular Army is given a military rating, although he may be a rather recent recruit whose life has been almost entirely that of a civilian, whereas a mechanic is given a civilian rating although he may have spent several years in the Army. As a basis for economic-social groups, we regard commissioned officers as in the higher group and enlisted men as in the lower group, disregarding the fact that an occasional enlisted man may have been reared in a well-to-do family and may have an excellent academic education; and we regard "white collar" employees as in the higher group and laborers and artisans as in the lower group, disregarding the fact that some mechanics have larger incomes than some clerks and may be better educated. The groups as a whole will correctly represent the pattern on which the group is based. The groups afford a basis for ascertaining the correlation between incidence of trichinae and the food habits as modified by occupation, education, standards of living, travel, and other factors. A break-down of some of the major groups affords a basis for examining the soundness of the correlation or lack of correlation shown in the major group. The incidence in the various groups is shown in table 1.

TABLE 1.—*Incidence of trichinae in various groups as found in 300 post-mortem examinations*

Group	Total number in group	Number infested	Percent infested
Males	205	27	13.2
White males	134	24	17.9
Colored males	71	3	4.2
Females	93	14	15.0
White females	37	3	8.1
Colored females	56	11	19.6
Whites	171	27	15.8
Negroes	127	14	11.0
Military (Army-Navy)	44	11	25.0
Officers	17	4	23.5
Enlisted men	27	7	25.9
Army	35	8	22.9
Navy	9	3	33.3
Civil	255	30	11.8
Sea (Navy and merchant marine)	22	6	27.3
Merchant marine	13	3	23.1
Land	277	35	12.6
Mentally deranged under long hospitalization	65	5	7.7
Mentally sound or not under long hospitalization	235	36	15.3
High economic-social status (whites)	52	5	9.6
Low economic-social status (all races)	246	36	14.6

With the correlations between the incidence of trichinae and the groups into which we have divided our 300 cases, we turn now to the basic explanations for the correlations. As a basis for all other explanations we take the obvious and commonly accepted idea of the correlation of trichinosis with food habits leading ordinarily to the eating of raw or undercooked pork and pork products, and disregarding such minor items as the eating of raw or undercooked bear meat or similar foods as rare sources of trichinae in man.

SEX AND RACE

As regards the somewhat higher incidence of trichinae in females than in males, a sorting of these groups on other bases indicates that the average incidence on the basis of sex alone is not definitely significant of the existing correlations with sex. Combining the factor of race, and disregarding our one Mongolian (negative), with the factor of sex, we have the following incidences: White males (24 positives in 134 cases), 17.9 percent; white females (3 positives in 37 cases), 8.1 percent; colored males (3 positives in 71 cases), 4.2 percent; colored females (11 positives in 56 cases), 19.6 percent. It is obvious, then, that the rather close incidences of 13.2 percent in males and 15.0 percent in females are actually due to combining a high incidence in white males with a low incidence in colored males, and a low incidence in white females with a high incidence in colored females. As an item bearing on the race incidence we note further that, of our total of 171 whites, we have 52 cases, or 30.4 percent, in a high economic-social status, with none of our colored cases in the high group. Moreover, all of the cases associated with a high incidence of trichinae in military life and association with the sea, are males.

Our explanation for these incidences rests in part on what was stated in the previous paper on trichinosis by Hall and Collins (1937). The high incidence in white males is probably correlated in part with the high incidence among military men and those associated with the sea, of whom only 1 of our 44 military cases, or 2.3 percent, was colored, and only 2 of our 22 cases associated with the sea, or 9.1 percent, were colored. We associate the high incidence in white males with the wandering habit of the white male and a consequent exposure to all kinds of food, including raw or improperly cooked pork and pork products, a habit manifested not only in military life and in association with the sea, but also in such occupations in civil life on land as in the cases of many groups of laborers, traveling men, engineers, construction workers, explorers, prospectors, and others. By contrast, the colored male does not travel as much, and his travel, so far as its broad lines are concerned, is at present following a rather definite movement from south to north. So far as the colored males of Washington, D. C., are concerned, they represent to a large extent

a group which has moved from the South to Washington. The explanation for the surprisingly low incidence of trichinae in this group, we believe, lies in the point brought out in the previous paper by Hall and Collins (1937) as to the incidence of trichinae in man at New Orleans, 3.5 percent, as found by Hinman (1936), namely, that it is correlated with an assumed low incidence in Southern swine allowed to roam at will, often not under fence, in the woods and fields, and not fed swill or garbage, the sources of raw pork scraps which we regard as the most important factors in producing trichinosis in swine. This assumed low incidence is supported by the finding of a very low incidence in swine in Georgia. It seems probable that many of the colored males in our necropsy series had begun life in the South where the danger from trichinosis appears to be definitely lower than elsewhere in the United States, so far as indicated by available reports, and the slightly higher incidence in colored males here, 4.2 percent, over the New Orleans incidence may represent either the results of exposure in later life to the greater danger of trichina infestation in Washington, or our use of two techniques in examinations of diaphragms. Certainly, the difference between the incidence in colored males and that in our total series, the latter being over three times the former, is significant. Hinman has not attempted to explain the lower incidence found by him, and we put forth our explanation as a basis for further consideration of the question.

As regards the low incidence of trichinae among white females, it may be correlated in part with a more settled status as compared with the white male. It may be correlated in part with the fact that 8 of 37 white females, or 21.6 percent, are in a high economic-social status, as indicated by their occupation, with the likelihood that some of these were not associated with the preparation of food and the consequent exposure to the danger of tasting raw ham and similar foods, or tasting foods in course of preparation for cooking to ascertain whether they were properly seasoned. By contrast, most of the colored females in our series, for whom the occupation is known, are listed as domestics, a term commonly applied to servants who act in all or part of the capacities of cook, housemaid, and laundress, and almost always of cook at least. The use of colored servants as domestics of this sort is quite general in Washington; and it seems likely that, even though these colored females follow the general drift from the South to Washington, their exposure to danger from tasting raw and undercooked pork and pork products while engaged in their capacity as cooks in Washington is very great. Williams (1901) attributes the higher incidence in Negroes, 7.14 percent as against an average of 5.34 percent, to carelessness in the preparation of food and in eating. Of the 11 positives in our group, 6, or 54.5 percent, had

live trichinae only, and one other had a mixed infestation. In view of the fact that only 31.7 percent of our total positive cases show live trichinae only, it is probable that this much higher incidence among colored females can be correlated with somewhat recent exposure to trichinae under Washington conditions.

Unfortunately, our series of cases is overwhelmingly urban, only three cases, or 1 percent, being reported as farmers, although an unascertained number undoubtedly lived on farms during part of their lives. A study of diaphragms from the rural population might show a large number of cases of infestation in rural white females as a result of the handling and preparation of sausage and other pork products at hog-killing time on the farm.

It appears from the discussion up to this point that there is no definite correlation between trichina infestation and sex per se, as the high incidence among white males and the extremely low incidence among colored males show, and that there is no definite correlation between trichina infestation and race per se, as the high incidence among white males and the low incidence among white females, and the low incidence among colored males and the high incidence among colored females, show. The literature on post-mortem examinations for trichinae contains little information in regard to sex incidence. Williams (1901) had no data on one of his positive cases; in the 26 positive cases for which sex was known, there were 21 males and 5 females; but the number of negative males and females is not given, and so there is no basis for a consideration of incidence. McNaught and Anderson (1936) report no variation in incidence according to sex.

NATIONALITY

As a subordinate section of the race groups, we have considered the matter of nationality, but it is impossible to make any detailed analysis of figures on this basis. The term "American" applies correctly to citizens of all racial stocks, and since the onetime foreigner adopts American habits sooner or later, or, if he does not, his children or grandchildren do, there is no point at which one may draw the line and say that differences implied by the term "foreigner" now cease to imply those differences. In this comparatively new country, with a large influx of immigrants over a long period of years, such terms as "native" and "foreigner" do not imply such valid distinctions as they imply in older countries with few immigrants. Citizenship may be acquired in the first generation and American habits in the second generation, or American habits in the first generation and citizenship in the second generation. Hospital statistics quite generally disregard the question of nationality, and one can consider the question only on the basis of names, as a rule. Names are highly misleading in the case of the Negro, and in our series of 300 cases such names as

Kelly, Chaney, Terry, Brunson, Levi, Meyers, and Madre turn out to be the names of Negroes. In our series of 41 positive cases, 34 are names of English-Scotch-Irish origin customarily found among American·families for generations; 1 is Italian; 3 are German, with evidence that 1 individual, at least, was not first-generation German; and 3 are, respectively, Slavic, French, and Spanish, of whom 1 individual was a Negro and 1 was a soldier in the United States Army. Apparently, almost 83 percent of our cases are in persons who are admittedly Americans, so far as names are an indication; less than 2.5 percent are in Italians; probably less than 7 percent are in Germans; and the indications are that not more than 2.5 percent are in persons of other nationalities. However, in our total series in which names are given, there are 20 names which are German, Italian, French, Spanish, Slavic, or Mongolian; and since 7 of our positive cases, over one third of these 20 cases, bear such names, it suggests that the incidence is higher among these racial groups, regardless of citizenship, than among those with names customarily regarded as common American names.

From these data we infer that the incidence of trichinae is higher among groups of such racial stocks as the Teutonic, Latin, and Slavic groups than among so-called native Americans. However, since the latter are by far the larger group numerically, much the greater number, though not the greater proportion, of cases of trichina infestation will be in this group, with an incidence slightly below the average for all cases so far as we have data available at present. Apparently the idea, generally believed and stated, that Germans and Italians are more likely to have trichinosis, has some justification; but the fact should be brought out that the majority of cases will be in native Americans.

In the literature on post-mortem examinations for trichinae, Williams (1901) found his highest percentage of positives (16.66 percent) in Italians and in Canadians, the Germans following with 12.24 percent, the British and Irish with 8.06 percent, Negroes with 7.14 percent, and last of all, American whites with 2.89 percent. The findings in this connection would doubtless vary with location and the concomitant variation in population; and our findings indicate that his figures for Italians, Canadians, and Germans do not vary greatly from our average of 13.67 percent, any more than do our figures for American whites vary, as his do, from our average figure. There have doubtless been some changes in food habits of our population and in methods of raising swine in various localities in the 35 years since Williams made his study, and the time at which a study was made must be taken into consideration in making comparisons of incidences. It appears to be true that the correlation between incidence of trichinae and nationality, especially that indicated by the

common statement that trichinosis is especially common in Germans and Italians, is misleading to the extent that it may result in our overlooking the many more cases probably present in our much larger native population. It may still be true that many of the epidemics which are diagnosed correctly as trichinosis in the United States show a preponderance of Germans and Italians, but this may be so partly because the common belief in the likelihood of this incidence leads to this diagnosis more often than in the cases of native Americans. There are many epidemics among our native rural population, especially at hog-killing time in the fall. However, apparently the epidemic cases are but a small part of the total cases of trichinosis in this country, and a more accurate concept of incidence on the basis of nationality may help us to detect more cases than are being detected at present.

MILITARY AND CIVIL GROUPS

The explanation for the high incidence of trichinae among the military forces of the Army and Navy probably follows from several factors bearing on food habits, which factors more than double the hazards of civilian life so far as trichinae are concerned. The military personnel moves about extensively and is exposed to the food habits of many regions. Under war conditions and even on the march the general level of life drops in the direction of primitive conditions. Hasty cooking of rations during short stops on a forced march, foraging, acceptance of food from friends, and similar circumstances may play a part. Until a comparatively recent time the Army had no organized food inspection, and the positive cases in older men might represent infections that would be avoided today by an inspection that took cognizance of certain dangerous pork products. The Navy personnel is evidently exposed to the food habits of many lands; and, in spite of warnings and education in regard to dangers from food in many ports, the evidence indicates that such warnings are either more or less disregarded or may not entirely cover the possibilities as regards trichinosis. However, the danger is probably greatest in American ports. By contrast with the military groups, if we consider only the six civilian hospitals of Washington, eliminating the five Federal hospitals, we find 17 positives in 120 cases, or 14.2 percent. Eliminating all children below the age of 17, we find 16 positives in 104 cases, or 15.4 percent.

SEA AND LAND GROUPS

The high incidence of trichinae among men associated with the sea might be explained for both the Navy and the merchant marine, on the basis noted above, as due to extensive travel and exposure to the food habits of many regions. In addition, there is little or no super-

vision, warning, or education in regard to food so far as the personnel of the merchant marine is concerned, and doubtless one of the pleasures associated with life in the merchant marine is the opportunity it affords to sample the foods of all lands. The apparent result is to more than double the hazards of life by land so far as trichinae are concerned. One case of a man making a living as a fisherman is not included in this series, since his occupation would not result in travel to various land regions, and would be correlated with an increased fish diet rather than with any exposure to raw or undercooked pork. There is an objection to the idea that travel in foreign countries is an important factor in producing trichinosis, and that is that trichinae appear to be most plentiful in the United States. Perhaps the cause is to be sought in American pork and pork products on American ships. Finally, the high incidence of trichinae at Boston, 27.6 percent, and at San Francisco, 24 percent, requires that we consider these ports and our other Atlantic and Pacific ports and naval bases as places possibly responsible for an indicated high incidence of trichinae in the Navy and merchant marine.

MENTAL STATUS AND LENGTH OF HOSPITALIZATION

As regards the low incidence of trichinae among the mentally deranged under prolonged hospitalization, we believe that the idea that mental derangement is correlated with a low incidence of trichinae can be definitely rejected. The literature of parasitology is quite in agreement to the effect that, in the absence of other qualifying factors, mental derangement is associated with a higher incidence of parasitism in general, not a lower incidence, than among the mentally sound. The correlation here is with prolonged hospitalization under modern sanitary conditions; with the proper cooking of food and with the patient restrained from freedom of movement to an extent that prevents exposure to food of other sorts. In this connection we call attention to Williams' (1901) findings of "an undue proportion of positive cases [of trichinosis] among the insane." In his total series of 505 cases, the incidence of trichinae was 5.34 percent (27 cases); of the total cases, 82 patients were insane, and 10 of these, or about 12.2 percent, were infested with trichinae. This reversal of our findings presumably follows from the fact that 35 years ago insane persons were not committed to hospital as often or as promptly as they are now, and that the sanitary level of hospitals for the insane at that time was not as high as it is now, especially not as high as it is in St. Elizabeths, the hospital from which our cases came. Our 57 negative cases had been hospitalized for an average of 9.2 years, with a maximum of approximately 44 years and a minimum of 10 days. Our 5 positive cases had been hospitalized for an average of 6.6 years, but 1 of these cases was hospitalized for almost 29 years, leaving

an average of only 1 year of hospitalization for the other 4 cases. The trichinae were all dead in the case hospitalized for almost 29 years, and in one case hospitalized for 1 month; they were in mixed live and dead infestations in 2 patients hospitalized for 3 years and for 9 months, respectively; and they were all alive in the case of a patient hospitalized for 2 months.

In this connection we would point out that a study of diaphragms from mentally deranged patients hospitalized under modern sanitary conditions for relatively long periods of time, with wide variations in the time element, presents the best basis known to us, aside from prisoners confined in jails and penitentiaries under modern sanitary conditions, for ascertaining the length of time trichinae may live in man, as well as for testing our theory that rapidity of calcification and death of trichinae may be proportional to intensity of infestation. The literature on this subject, so far as we have examined it, is definitely unconvincing. Patients who have had clinical trichinosis and who have been examined post mortem for trichinae years later, after having lived under ordinary unconfined conditions of life outside a hospital, jail, or penitentiary, have been found to harbor live trichinae; but the possibility that these persons who have had trichinosis have not been subsequently reinfected with trichinae as a result of the same food habits that led to trichinosis in the first case can never be excluded. Any assumption that a person who had suffered from trichinosis would always avoid raw or undercooked pork and pork products subsequently is unsound, and Staeubli (1909) states that one finds in the literature strikingly frequent references to the fact that trichinosis patients cannot be persuaded, or can be persuaded only with great difficulty, to refrain from eating raw pork, in spite of knowing that this was the cause of their illness.

ECONOMIC-SOCIAL STATUS

As regards high and low economic-social status, the lower incidence of trichinae, 9.6 percent, in persons of high economic status, as compared with the higher incidence, 14.6 percent, in persons of low economic-social status, must be interpreted on the fundamental basis of correlation with food habits. In the higher status, persons eat better food and the food is better prepared; they are more discriminating and better informed than those in the lower group; and a smaller proportion of persons in this group is associated with the handling and preparation of food in the kitchen, in packing and processing plants, and elsewhere. In the lower status, many persons are compelled by economic necessity to eat inferior and dubiously suitable food and to eat it more or less regardless of the inferior preparation and cooking; they are less discriminating and less well informed on the subject of food and its preparation, and on the possibilities of

disease transmission through food; and they are more generally associated with the handling and preparation of food in all places. The incidence of trichinae for the higher group indicates that the protection afforded by the characteristics of the group is only partial and not complete, and that individual tastes, transient necessities, and other circumstances combine in some cases to break down the group barriers against trichinae. In the case of the military group it appears that the hazard from trichinae associated with the military life is a hazard shared by officers and enlisted personnel, with little, if any, protection to officers as a result of their higher status, since 4 of 17 officers, or 23.5 percent, and 7 of 27 enlisted men, or 25.9 percent had trichinae.

AGE

As regards age, we have no data on 5 cases, leaving 295 cases for which the age is known. These cases are tabulated in table 2 by decadal age groups together with the data as to whether the trichinae present were all alive, some alive and some dead, or all dead.

TABLE 2.—*Incidence and state of trichinae by age at death*

Age at death	Total number of cases	Positive				State of trichinae		
		Number	Percent	Percent				
				0–50 years	51–100 years	Live	Mixed	Dead
0–10	16	1	6.2			1	0	0
11–20	7	0	0			0	0	0
21–30	37	6	16.2	*13.69*		2	2	2
31–40	37	6	16.2			3	0	3
41–50	71	10	14.1			3	5	2
51–60	56	8	14.3			3	2	3
61–70	43	7	16.3			1	1	5
71–80	20	2	10.0	--------	*13.64*	0	0	2
81–90	7	0	0			0	0	0
91–100	1	1	100.0			0	0	1
Unknown	5	0	0			0	0	0

On the basis of our average incidence, 13.67 percent, the total number of cases in the decades 11–20, 81–90, and 91–100, viz, 1 to 7, is too small to give more than a 50–50 chance, at most, of detecting one positive in a sample of that size or to make a positive finding significant, and the results, either all negative or all positive, are not significant. Undoubtedly there is a correlation between a time factor and the incidence of trichinae, since incidence is definitely correlated with food. Thornbury (1897) notes that, in swine, "age predisposes to infection." Evidently a shorter time of exposure to trichinae in food in early life, together with the more restricted and specialized diet in at least the first few years of life, is probably responsible, in our series, for the lower incidence, 1 positive in 23 cases, or 4.3 percent, in the first two decades of life.

The true estimate, on the basis of food habits, is somewhat higher, since in our series of 0–10 years we have two premature births, and three babies aged 1 day, 3 months, and 10 months, respectively, all in the group below 1 year of age, which is generally rejected in diaphragm studies of trichinosis. Disregarding these, there would be 1 positive in 18 cases, or 5.6 percent. Our justification for considering these 5 cases of premature births and extremely young infants is that the matter of prenatal infection deserves consideration in a study of incidence. In spite of all the negative results from the studies of the older workers with only direct microscopic examination as their technique, and in spite of later work with the use of the digestion-Baermann technique, definite evidence of prenatal infection is found in the recent positive findings of Roth (1935). In a number of digestion-Baermann examinations of fetuses and newborn young of guinea pigs from mothers artificially infected with trichinae, he found 4 larvae in a composite sample of 4 fetuses, and 19 larvae in 1 guinea pig killed 3 days after birth. Accepting Roth's positive findings, even without the confirmation from other workers, which is ultimately essential in all scientific work, as more significant than the negative findings of others, the present status of the question of prenatal infection with trichinae appears to be this: Prenatal infection, usually with small numbers of larvae, does occur, apparently in a small minority of cases in which gravid mothers are infected with trichinae during the time they are gravid. Hence, a continuing study of diaphragms may be expected to give positive results in a large enough series of cases, in spite of the long odds against the coincidence of such cases with maternal infection and the infant coming to necropsy in a hospital from which cases are being examined for the incidence of trichinae. Quite obviously, the presence of these premature births and very young infants in our series lowers the general incidence and introduces a factor other than the food habits of the individual examined, thereby indicating that our incidence, if based entirely on trichinae present as a result of food habits, would be higher than it is.

Where our samples are relatively large, in the decades of life from 21 to 70, the percentages are somewhat higher than our average of 13.67, compensating for the lower incidence in the first two decades. Combining our too small samples for the last 3 decades, 71 to 100, we have an incidence of 10.7 percent, a figure which might be raised if we had larger samples, following the theory that increasing age affords increasing chances of infection from food, up to a certain point, at least, and especially if we could detect light infestations with dead trichinae, a matter discussed in the first paper in this series by Hall and Collins.

The importance of being able to detect dead trichinae in these older age groups is evident from an inspection of table 1. It will be noted

that only live trichinae are found in the first decade, and that infestations with only live trichinae occur in every decade from 21 through 70. Infestations with both live and dead trichinae, as mixed infestations, begin in the decade 21 to 30 and run through the decade 61 to 70. Infestations with only dead trichinae begin in the decade 21 to 30, continue through the decade 61 to 70 along with either only live trichinae or with mixed infestations, and are the only form of infestation found in the decades 71 to 100. Since the calcification and death of trichinae are definitely known to be associated with a time factor, these findings are to be expected. One may say that, with an increase in the time factor, as based on age, the incidence of trichinae in a large enough sample should show some rise and that the incidence of mixed infestations and infestations with dead trichinae should rise also, with a corresponding decrease in the incidence with only live trichinae. If we divide our age groups into the group from 0 to 50 years and from 51 to 100 years, there is an almost identical incidence of 13.69 and 13.64 percent. A larger series of cases might show, as our series does not, a slightly higher incidence in the older age group if our general theory of the effect of the time factor is correct and unqualified by other factors such as a mortality factor, which may exist, operating to increase the earlier mortality among recovered cases of trichinosis and tending to increase the number of deaths of recovered cases in the lower age groups, thereby preventing part of these cases from dying in older age groups. McNaught and Anderson (1936) likewise assume that incidence would increase with age, but their evidence is based on groups of dissimilar sorts that do not permit of direct comparison with our groups shown in table 2. They find no trichinae up to the age of 25, an incidence of 14.8 percent from 25 to 40 (15 years), of 26.6 percent from 40 to 75 (35 years), and of 29.1 percent after 75 years. For the same groups we find incidences of 9.5, 16.4, 14.2, and 13.3 percent.

A much larger series of cases may enable us to ascertain the average time in which trichinae in man calcify and die. Our series for the first two decades is too small to permit of any conclusions based on the fact that mixed infestations and infestations with dead trichinae only are first found in the decade 21 to 30. Moreover, we have suggested in the first paper on incidence by Hall and Collins (1937) that the rapidity of death of trichinae may be correlated with degree of infestation. Williams (1901) divides his cases, on a subjective estimate, into severe, moderate, and mild, and his report indicates that in severe cases only dead trichinae are present in about two-thirds of his cases, whereas only live trichinae are apparently present in about half of his moderate and mild cases, and mixed infestations in over one-fourth of these cases. These findings sustain the theory we have proposed.

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It seems probable that the time of death of trichinae is not conditioned entirely by a time factor. Brand, Holtz, and Vogel (1933) and Wantland (1934) have reported that the administration of such calcifying factors as irradiated ergosterol materially hastens the process of calcification of trichinae. Calcification is a process definitely associated with the death of trichinae, as it is with the death of cysticerci and many other animal parasites. Probably the nature of the food, especially as regards calcium and certain vitamins, has some effect on the longevity of trichinae, and there are doubtless other factors, such as the nature of the inflammatory reaction and various other defense mechanisms of the host, which may have a bearing on this point.

There are very few data in regard to age in the literature dealing with post-mortem examinations for trichinae. All of the persons in Williams' (1901) cases were over 14 years old, and trichinae were found in every decade from 11 to 20 years through 71 to 80 years, but the age for negatives is not reported. So far as we can translate his findings as to the state of the trichinae present, his series shows only live trichinae from the decade 11 to 20 through 71 to 80, what are probably mixed infestations from the decade 31 to 40 through 71 to 80, and only dead trichinae from 41 to 50 through 71 to 80. This agrees with the general trend of our findings.

DISCUSSION

While our break-down of our 300 cases does not always result in groups as large as is desirable for a study of incidence in these groups, it seems desirable, nevertheless, to make tentative correlations. The subject of trichinosis has had entirely too little attention, and the evidence from the 1,778 post-mortem examinations for trichinae in the United States shows quite convincingly that there is an immense number of cases of infestation in our population, and that a large number of clinical cases are never diagnosed. If the situation is actually as serious as we believe, it is a public health problem of major importance, and we need epidemiological data as a background for research and for the development of control measures. It is important that we ascertain the incidence on a geographic basis and correlate this incidence in various sections with those geographic conditions which have a bearing on infection with trichinae. It is important also that we ascertain the groups in our population that are most subjected to danger from trichina infection, as our control measures can be more intelligently organized with this information than they can without it. We must know where to look for our cases and why we expect to find them in any given region or group.

The fact that we have fewer data than we should like to have for examining the implications they present seems less important than

that the preliminary work be done as a basis for an examination of these implications by a much larger amount of work here and elsewhere in the future. We expect to continue our study to the point at which no objection is possible on the mathematical basis of inadequate sampling, but we hope that others will take up this line of research to the end that we may have a set of studies which are mutually supplementary and comprehensive enough to give a fairly correct picture of conditions over the entire United States. We urge that the microscopic examination for trichinae, using a press preparation of 1 gram of diaphragm muscle from near the tendinous portion, be made a routine part of post-mortem examinations. Sections are entirely unsatisfactory, as McNaught and Anderson have previously noted. Our own data are available only through the great courtesy and unfailing cooperation of physicians, technicians, and clerks who have gone to great trouble to supply us with diaphragms and data, and their share in our work is acknowledged with the greatest appreciation.

SUMMARY

On the basis of a study of 300 diaphragms reported in a previous paper by the present authors, which shows an incidence of 13.67 percent of trichina infestation, the writers have undertaken a study of correlation of incidence with population groups with the following results:

The incidence by groups, in descending order of incidence, is as follows: Navy, 33.3 percent; groups associated with extensive travel by sea (Navy and merchant marine), 27.3 percent; military (Army-Navy) enlisted personnel, 25.9 percent; military (Army-Navy) group (as a whole), 25 percent; military (Army-Navy) officers, 23.5 percent; merchant marine, 23.1 percent; Army, 22.9 percent; colored females (all in low economic-social status), 19.6 percent; white males, 17.9 percent; whites (male and female), 15.8 percent; mentally sound group or, at least, cases of minor derangement and not under prolonged hospitalization, 15.3 percent; females (white and colored), 15 percent; persons of low economic-social status (all races), 14.6 percent; (*average of all groups, 13.67 percent*); males (white, colored, and one Mongolian), 13.2 percent; groups associated with land (excluding extensive travel by sea), 12.6 percent; civilian group (as a whole), 11.8 percent; Negroes (male and female), 11 percent; persons of high economic-social status (all white), 9.6 percent; white females, 8.1 percent; mentally deranged group under prolonged hospitalization, 7.7 percent; colored males (all in low economic-social status), 4.2 percent.

The civilian population of Washington, on the basis of cases from 6 civilian hospitals only, has an indicated incidence of 14.2 percent, and if children under 17 are disregarded the incidence is 15.4 percent.

In all cases the indicated correlations between incidence of trichinae

and the groups examined are basically with reference to food habits as modified by such factors as occupation, education, standards of living, travel, methods of swine raising, exposure to raw or undercooked pork or protection from exposure by prolonged hospitalization.

A consideration of the age incidence by decades indicates that, at least up to some unascertained point, there is an increased incidence with increasing age, due apparently to the fact that an increase in the time factor increases the opportunities for infection. At some unascertained point there may be a mortality factor in the form of deaths occurring at an age earlier than would have been the case had it not been for pathologic conditions persisting after recovery from trichinosis, thereby removing from the older age groups some of the positives that might otherwise have appeared there. Positive findings in recent literature indicate the advisability of examining suitable muscle tissue from very young infants and those prematurely born, for the possibility of detecting prenatal infection with trichinae. The post-mortem study of suitable muscles from persons dying after prolonged confinement in hospitals, jails, and penitentiaries, under modern sanitary conditions precluding the eating of raw or undercooked pork, is suggested as a basis for obtaining more precise information as to the time larval trichinae survive alive in human beings, and the time required for calcification of the cysts and for the death of the trichinae. It is recommended that the microscopic examination of 1 gram of diaphragm muscle, as a press preparation and not by sectioning, be made a routine procedure in the post-mortem examinations by pathologists.

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DEATHS DURING WEEK ENDED APRIL 3, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 3, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	9,381	9,302
Average for 3 prior years	9,227	
Total deaths, first 13 weeks of year	132,771	127,693
Deaths under 1 year of age	591	623
Average for 3 prior years	633	
Deaths under 1 year of age, first 13 weeks of year	8,174	7,675
Data from industrial insurance companies:		
Policies in force	69,614,527	68,304,318
Number of death claims	15,923	14,248
Death claims per 1,000 policies in force, annual rate	11.9	10.9
Death claims per 1,000 policies, first 13 weeks of year, annual rate	11.5	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 10, 1937, and Apr. 11, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936
New England States:								
Maine	1		3	19	4	152	1	1
New Hampshire					113	29	0	0
Vermont						852	0	0
Massachusetts	3	7			736	1,170	8	8
Rhode Island		2		8	232	75	1	8
Connecticut	4	3	12	3	799	91	2	4
Middle Atlantic States:								
New York	31	44	[1] 26	[1] 14	1,020	2,842	10	18
New Jersey	7	12	13	9	3,300	258	5	8
Pennsylvania	37	21			661	863	13	7
East North Central States:								
Ohio	13	17	21	26	270	237	2	18
Indiana	4	16	110	39	137	13	5	2
Illinois	46	30	105	68	85	83	1	12
Michigan	18	14		11	97	58	2	4
Wisconsin	4	3	49	45	19	90	2	1
West North Central States:								
Minnesota	14	2	1		22	239	1	2
Iowa	1	2		11	8	4	0	2
Missouri	41	11	111	680	55		1	9
North Dakota	1	1	24	10	1	1	0	0
South Dakota		2			2		0	0
Nebraska	1	5		1	12	27	1	1
Kansas	5	12	4	133	26	19	4	1
South Atlantic States:								
Delaware	3		5		39	13	2	0
Maryland [2]	15	2	12	8	872	247	5	20
District of Columbia	4	7	1	1	116	68	2	8
Virginia	13	8		414	248	148	9	16
West Virginia	5	9	110	165	19	61	7	12
North Carolina	17	19	61	50	204	44	4	4
South Carolina [3]	2	4	528	331	39	40	0	5
Georgia	9	8	344	201			2	7
Florida	7	1	24	38	17	14	1	5
East South Central States:								
Kentucky	11	11	21	312	448	39	12	18
Tennessee	7	7	141	745	53	69	7	7
Alabama [3]	10	7	648	1,440	9	18	10	6
Mississippi [3]	4	4					1	8

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 10, 1937, and Apr. 11, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936
West South Central States:								
Arkansas	1	5	82	568	1	5	0	2
Louisiana	7	4	54	291	6	62	1	2
Oklahoma [4]	16	11	115	236	55	12	2	5
Texas [3]	43	52	792	646	668	483	2	16
Mountain States:								
Montana		1	11	121	39	15	1	5
Idaho [5]	1	1	10	4	15	39	1	1
Wyoming	1	1			3	2	0	0
Colorado	5	5			11	13	1	4
New Mexico		3	4	15	81	35	0	4
Arizona		3	38	110	238	65	3	3
Utah [2]	2				33	18	0	0
Pacific States:								
Washington	2			3	46	378	1	2
Oregon [5]			34	98	4	276	1	0
California	28	20	417	673	138	2,342	5	8
Total	444	397	3,931	7,542	11,001	11,559	139	259
First 14 weeks of year	7,218	8,172	259,592	114,002	92,723	125,487	2,347	3,379

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936
New England States:								
Maine	0	0	15	11	0	0	2	1
New Hampshire	0	0	13	10	0	0	0	0
Vermont	0	0	2	7	0	0	0	0
Massachusetts	0	0	274	312	0	0	1	0
Rhode Island	0	0	76	35	0	0	2	0
Connecticut	0	0	162	47	0	0	0	0
Middle Atlantic States:								
New York	2	2	898	986	0	0	5	5
New Jersey	0	0	174	341	0	0	1	0
Pennsylvania	0	0	598	348	0	0	7	4
East North Central States:								
Ohio	0	0	245	261	3	1	4	10
Indiana	0	1	234	287	9	3	0	2
Illinois	0	0	763	789	23	4	2	6
Michigan	2	0	712	318	17	0	0	4
Wisconsin	0	0	351	586	4	3	0	6
West North Central States:								
Minnesota	0	0	166	402	5	4	0	0
Iowa	0	0	295	204	53	47	0	0
Missouri	0	0	519	167	73	19	0	2
North Dakota	0	0	30	42	15	4	0	2
South Dakota	0	0	97	79	6	44	0	0
Nebraska	0	0	88	170	5	24	0	0
Kansas	0	0	355	351	20	45	1	0
South Atlantic States:								
Delaware	0	0	3	10	0	0	2	1
Maryland [2]	0	0	43	58	0	0	0	0
District of Columbia	0	0	11	18	0	0	1	1
Virginia	0	1	14	56	2	0	10	4
West Virginia	1	0	56	39	0	0	3	3
North Carolina	1	1	45	14	0	0	2	1
South Carolina [3]	2	0	6	3	0	0	1	2
Georgia [3]	0	0	12	20	0	0	0	2
Florida	0	0	18	3	0	0	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 10, 1937, and Apr. 11, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936	Week ended Apr. 10, 1937	Week ended Apr. 11, 1936
East South Central States:								
Kentucky	0	0	58	47	2	0	11	7
Tennessee	0	0	35	28	0	0	6	5
Alabama [3]	1	0	15	6	0	0	3	0
Mississippi [2]	1	1	7	6	0	0	0	0
West South Central States:								
Arkansas	0	0	12	5	2	0	3	0
Louisiana	0	0	14	15	1	0	11	5
Oklahoma [4]	0	0	33	39	3	3	1	1
Texas [3]	0	0	110	165	1	1	16	13
Mountain States:								
Montana	0	1	17	93	36	15	3	0
Idaho [5]	0	0	20	35	1	1	0	0
Wyoming	0	0	17	51	8	2	0	0
Colorado	0	0	34	107	5	0	0	0
New Mexico	1	0	19	56	0	0	4	0
Arizona	0	0	23	28	0	0	1	0
Utah [1]	1	0	18	55	0	1	0	0
Pacific States:								
Washington	1	0	36	85	21	22	0	0
Oregon [5]	0	1	53	54	17	3	1	2
California	4	4	196	289	19	0	2	2
Total	17	12	6,992	7,138	351	246	108	98
First 14 weeks of year	306	238	95,374	110,670	4,333	3,119	1,514	1,474

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 10, 1937, 24 cases, as follows: South Carolina, 5; Georgia, 12; Alabama, 3; Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 10, 1937, 2 cases, as follows: Idaho, 1; Oregon, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1937										
Colorado	4	21	522		22		0	163	10	1
February 1937										
Colorado	6	18	8		20		0	208	9	1
March 1937										
Arkansas	23	10	1,252	19	6	28	1	73	12	3
Connecticut	4	16	160		2,791		0	618	0	4
Delaware	3	9	28		334		0	35	0	0
New Mexico	7	14	207	4	442	3	1	124	4	6
South Carolina		116	5,629	538	150	76	1	29	1	6
West Virginia	33	25	814		54		1	191	1	21

January 1937

Colorado: Cases
- Chicken pox 123
- Dysentery 1
- Impetigo contagiosa 2
- Jaundice 1
- Mumps 32
- Septic sore throat 10
- Whooping cough 184

February 1937

Colorado:
- Chicken pox 119
- Encephalitis, epidemic or lethargic 2
- Impetigo contagiosa 10
- Mumps 51
- Septic sore throat 1
- Whooping cough 243

March 1937

Anthrax:
- Delaware 1

Chicken pox:
- Arkansas 97
- Connecticut 763
- Delaware 73
- New Mexico 68
- South Carolina 152
- West Virginia 140

Conjunctivitis:
- Connecticut 18

March 1937—Continued

Dengue:
- South Carolina 2

Dysentery:
- Connecticut (bacillary) 1
- New Mexico (bacillary) 1

Diarrhea:
- South Carolina 169

Encephalitis, epidemic or lethargic:
- Arkansas 1
- Connecticut 1

German measles:
- Connecticut 128
- Delaware 45
- New Mexico 6
- South Carolina 14

Hookworm disease:
- Arkansas 2
- South Carolina 136

Lead poisoning:
- Connecticut 5

Mumps:
- Arkansas 53
- Connecticut 631
- Delaware 42
- New Mexico 99
- South Carolina 49
- West Virginia 132

Ophthalmia neonatorum:
- Arkansas 2
- Connecticut 3
- South Carolina 6

March 1937—Continued

Paratyphoid fever:
- Arkansas 1
- South Carolina 4

Rabies in animals:
- Connecticut 5
- South Carolina 48
- West Virginia 3

Septic sore throat:
- Connecticut 30
- New Mexico 3

Tetanus:
- Delaware 1
- South Carolina 1

Trachoma:
- Arkansas 1

Trichinosis:
- Connecticut 2

Typhus fever:
- Connecticut 1
- South Carolina 4

Undulant fever:
- Connecticut 3
- West Virginia 2

Whooping cough:
- Arkansas 52
- Connecticut 331
- Delaware 60
- New Mexico 105
- South Carolina 201
- West Virginia 318

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 3, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose o showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	228	453	118	7,617	902	2,710	22	419	23	1,521	-------
Current week [1]	141	386	111	3,252	980	2,508	54	419	22	1,368	-------
Maine:											
Portland	0	------	0	1	2	5	0	0	0	1	23
New Hampshire:											
Concord	0	------	0	0	3	1	0	0	0	0	11
Manchester	0	------	3	2	0	5	0	0	0	0	8
Nashua	0	------	0	3	0	2	0	0	0	0	5
Vermont:											
Barre	0	------	0	0	2	0	0	1	0	4	6
Burlington	0	------	0	0	0	0	0	0	0	0	12
Rutland	0	------	0	0	2	2	0	1	0	6	13
Massachusetts:											
Boston	0	------	0	16	20	73	0	9	0	82	231
Fall River	0	------	0	31	4	2	0	0	0	14	42
Springfield	0	------	0	2	2	1	0	2	0	26	48
Worcester	0	------	0	84	1	7	0	1	0	25	42
Rhode Island:											
Pawtucket	0	------	0	15	0	3	0	0	0	1	11
Providence	0	------	0	228	6	35	0	4	0	30	61
Connecticut:											
Bridgeport	1	------	1	14	3	57	0	0	0	0	39
Hartford	0	------	0	3	7	5	0	0	1	6	54
New Haven	0	------	1	0	0	8	0	1	0	4	41
New York:											
Buffalo	0	------	2	119	11	20	0	11	0	30	176
New York	23	22	14	345	197	454	0	85	2	68	1,680
Rochester	0	------	0	0	7	10	0	2	0	9	64
Syracuse	0	------	0	2	9	42	0	0	0	22	66
New Jersey:											
Camden	2	------	0	1	5	9	0	0	0	5	34
Newark	------	------	------	------	------	------	------	------	------	------	------
Trenton	2	------	0	2	6	13	0	3	1	1	48

[1] Figures for Newark and Brunswick estimated; reports not received.

City reports for week ended Apr. 3, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Pennsylvania:											
Philadelphia	2	13	5	26	58	247	0	36	3	78	615
Pittsburgh	3	8	6	52	35	69	0	6	0	26	206
Reading	0	-	1	55	6	21	0	0	0	7	26
Scranton	0	-	-	0	-	14	0	-	0	2	-
Ohio:											
Cincinnati	1	-	0	196	17	10	0	11	0	13	147
Cleveland	0	28	7	70	20	66	0	8	0	49	194
Columbus	4	3	3	5	8	11	0	3	0	17	81
Toledo	0	3	3	83	9	9	0	3	0	24	93
Indiana:											
Anderson	0	-	0	1	1	10	0	0	0	0	14
Fort Wayne	1	-	2	0	1	1	0	0	0	0	30
Indianapolis	0	-	2	81	24	42	0	6	0	24	122
Muncie	0	-	0	0	1	8	0	0	0	3	18
South Bend	0	-	0	1	4	5	0	0	0	11	13
Terre Haute	2	-	0	0	0	2	0	0	0	0	17
Illinois:											
Alton	0	-	0	0	1	5	0	0	0	4	6
Chicago	15	16	6	43	60	279	0	41	1	71	758
Elgin	0	-	0	0	0	1	0	0	0	3	11
Moline	0	-	0	0	2	0	0	0	0	6	9
Springfield	2	-	0	1	1	10	1	0	0	5	22
Michigan:											
Detroit	7	-	0	15	37	330	0	20	0	47	283
Flint	0	-	0	0	9	24	0	0	0	3	31
Grand Rapids	2	-	0	35	5	12	0	1	0	19	42
Wisconsin:											
Kenosha	0	-	0	0	1	6	0	0	0	0	11
Madison	0	-	0	0	0	6	0	0	0	18	13
Milwaukee	1	1	1	4	10	69	0	1	0	21	114
Racine	0	-	0	0	2	6	0	0	0	2	15
Superior	0	-	0	0	0	9	0	0	0	5	9
Minnesota:											
Duluth	0	-	0	0	5	20	0	0	1	6	24
Minneapolis	0	-	1	2	9	20	0	1	0	49	96
St. Paul	0	1	1	0	15	26	0	3	0	139	80
Iowa:											
Cedar Rapids	0	-	-	2	-	1	0	-	0	0	-
Davenport	0	-	-	0	-	1	0	-	0	0	-
Des Moines	2	-	-	0	-	32	0	-	0	0	41
Sioux City	0	-	-	1	-	17	0	-	0	0	-
Waterloo	0	-	-	1	-	10	0	-	0	9	-
Missouri:											
Kansas City	1	-	2	3	16	81	0	7	0	26	122
St. Joseph	1	-	0	1	6	30	38	0	0	0	20
St. Louis	15	-	1	2	15	01	2	9	0	84	233
North Dakota:											
Fargo	0	-	0	0	0	4	0	0	0	0	7
Grand Forks	0	-	-	0	-	0	0	-	0	1	-
Minot	0	-	0	0	0	0	0	0	0	0	5
South Dakota:											
Aberdeen	0	-	-	0	-	4	0	-	0	0	-
Nebraska:											
Omaha	0	-	0	2	8	10	5	2	0	5	56
Kansas:											
Lawrence	0	-	0	0	1	4	0	0	0	2	8
Topeka	0	-	0	0	0	10	1	0	0	5	2
Wichita	0	-	0	5	3	9	5	1	0	14	22
Delaware:											
Wilmington	5	-	0	15	8	3	0	0	0	1	42
Maryland:											
Baltimore	9	10	5	716	35	24	0	7	1	56	250
Cumberland	0	-	0	0	0	5	0	0	0	2	14
Frederick	0	-	0	3	0	0	0	0	0	0	5
District of Columbia:											
Washington	11	2	2	69	27	8	0	9	0	8	200
Virginia:											
Lynchburg	0	-	0	1	2	0	0	0	0	5	24
Norfolk	0	1	1	1	2	2	0	0	0	2	33
Richmond	2	-	2	1	8	1	0	1	0	0	67
Roanoke	0	-	0	96	1	0	0	0	0	5	15
West Virginia:											
Charleston	0	3	0	0	4	1	0	0	0	1	23
Huntington	0	-	-	1	-	0	0	-	0	0	-
Wheeling	0	-	0	1	1	6	0	0	0	5	24

City reports for week ended Apr. 3, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Gastonia	0	-	-	0	-	0	0	-	0	1	-
Raleigh	0	-	0	0	2	1	0	1	0	0	6
Wilmington	0	-	1	0	4	0	0	0	0	1	14
Winston-Salem	1	8	0	0	4	5	0	1	0	1	15
South Carolina:											
Charleston	0	101	1	0	9	0	0	0	1	0	23
Columbia	-	-	-	-	-	-	-	-	-	-	-
Florence	0	-	0	0	3	0	0	0	0	0	15
Greenville	0	-	0	0	4	1	0	2	0	2	20
Georgia:											
Atlanta	0	17	4	0	11	6	0	8	1	0	77
Brunswick	-	-	-	-	-	-	-	-	-	-	-
Savannah	0	56	2	0	1	1	0	1	1	6	38
Florida:											
Miami	2	9	0	0	1	0	0	3	0	0	41
Tampa	1	1	1	1	1	2	0	3	0	0	21
Kentucky:											
Covington	0	-	0	7	0	1	0	1	0	0	16
Lexington	1	15	0	5	2	1	0	1	0	12	27
Louisville	0	3	2	7	10	8	0	6	0	27	91
Tennessee:											
Knoxville	0	4	2	2	2	0	0	0	0	0	35
Memphis	0	-	5	0	13	4	0	6	0	22	95
Nashville	0	-	2	0	16	6	0	2	0	3	62
Alabama:											
Birmingham	0	18	5	0	18	2	0	6	0	1	103
Mobile	0	-	3	2	2	2	0	1	0	0	21
Montgomery	0	2	-	0	-	1	0	-	0	0	-
Arkansas:											
Fort Smith	0	-	-	0	-	1	0	-	0	1	-
Little Rock	0	-	0	1	4	5	0	3	0	0	9
Louisiana:											
Lake Charles	1	-	0	0	1	0	0	0	0	0	6
New Orleans	10	13	2	0	20	4	0	10	3	0	161
Shreveport	0	-	1	0	8	0	0	6	1	2	50
Oklahoma:											
Oklahoma City	2	-	0	10	5	10	0	0	0	0	35
Tulsa	0	-	-	0	-	11	0	-	0	0	-
Texas:											
Dallas	2	6	6	41	11	17	0	1	0	12	71
Fort Worth	0	-	1	43	4	5	0	2	0	4	34
Galveston	0	-	0	0	2	0	0	0	0	0	12
Houston	7	-	2	2	15	1	0	11	2	9	90
San Antonio	2	-	2	13	7	1	0	7	0	1	62
Montana:											
Billings	0	-	0	0	2	0	1	0	0	0	14
Great Falls	0	-	0	0	1	1	1	1	0	0	7
Helena	0	-	0	5	0	8	0	0	0	0	3
Missoula	0	-	0	0	2	0	0	0	0	0	8
Idaho:											
Boise	0	-	0	0	1	0	0	0	0	0	5
Colorado:											
Colorado Springs	0	-	0	0	3	13	0	1	0	0	16
Denver	3	-	2	1	11	11	0	9	1	47	90
Pueblo	0	-	0	0	4	3	0	0	0	0	13
New Mexico:											
Albuquerque	0	-	1	1	2	5	0	1	0	3	12
Utah:											
Salt Lake City	0	-	0	23	0	11	0	0	0	15	24
Washington:											
Seattle	0	-	1	5	3	8	0	5	0	10	91
Spokane	0	1	1	4	2	3	0	2	0	13	34
Tacoma	0	-	0	0	4	3	0	0	0	0	27
Oregon:											
Portland	1	4	1	1	3	10	2	5	1	2	84
Salem	0	-	-	0	-	1	0	-	0	5	-
California:											
Los Angeles	4	25	2	10	21	36	0	23	0	67	310
Sacramento	0	22	0	10	8	10	0	4	2	0	31
San Francisco	0	5	1	0	15	20	0	12	0	4	170

City reports for week ended Apr. 3, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Virginia:			
Boston	5	5	0	Lynchburg	0	0	1
Fall River	1	1	0	Richmond	2	0	0
Springfield	2	1	0	North Carolina:			
Worcester	0	1	0	Wilmington	0	1	0
Rhode Island:				Winston-Salem	1	1	0
Providence	1	0	0	Georgia:			
New York:				Atlanta	1	0	0
New York	4	2	1	Florida:			
Rochester	1	0	0	Miami	3	2	0
Pennsylvania:				Kentucky:			
Philadelphia	1	1	0	Louisville	1	0	0
Pittsburgh	0	1	0	Knoxville	0	2	0
Ohio:				Memphis	0	1	0
Cincinnati	3	2	0	Tennessee:			
Cleveland	4	0	0	Nashville	1	0	0
Columbus	1	1	0	Alabama:			
Toledo	0	1	0	Birmingham	8	1	0
Indiana:				Oklahoma:			
Indianapolis	0	1	0	Tulsa	0	0	1
Illinois:				Texas:			
Chicago	1	0	1	Houston	1	0	0
Moline	1	0	0	Colorado:			
Minnesota:				Colorado Springs	0	1	0
Minneapolis	1	0	0	New Mexico:			
Missouri:				Albuquerque	0	1	0
St. Joseph	0	1	0	Washington:			
Maryland:				Seattle	2	0	0
Baltimore	9	0	0	Oregon:			
District of Columbia:				Portland	0	0	1
Washington	2	0	0	California:			
				Los Angeles	1	0	0

Dengue.—Cases: Charleston, S. C., 2.
Encephalitis, epidemic or lethargic.—Cases: New York, 1; Cleveland, 1; Birmingham, 1; Oklahoma City, 1.
Pellagra.—Cases: Atlanta, 3; Savannah, 5; Knoxville, 1.
Typhus fever.—Cases: New York, 1: Savannah, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 27, 1937.—During the 2 weeks ended March 27, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	1			3	2		2			8
Chicken pox		9		282	529	54	76	13	57	1,020
Diphtheria		2	2	30	7	4				45
Dysentery				1						1
Erysipelas				9	8	3	3	3	9	35
Influenza	3	232	312	548	740	22	73		329	2,259
Lethargic encephalitis					1					1
Measles		23	57	951	713	152	638	128	893	3,555
Mumps		1	8		563	25	35	16	70	718
Paratyphoid fever		1			4					5
Pneumonia	6	1			57		13		15	92
Poliomyelitis					1			1		2
Scarlet fever		11	8	193	269	60	89	37	16	683
Smallpox						1				1
Trachoma							24		1	25
Tuberculosis	5	1	24	92	100	40	4	5	41	312
Typhoid fever		3	1	22	3		1		1	31
Undulant fever				1	3		2			6
Whooping cough		31	1	190	125	53	38	20	12	470

NOTE.—No report was received from Alberta for the week ended Mar. 27, 1937.

DOMINICA

Vital statistics—Year 1936.—Following are vital statistics for the Presidency of Dominica for the year 1936:

Estimated population Dec. 31, 1936	48,280
Number of births	1,506
Births per 1,000 population	31.58
Number of stillbirths	63
Total deaths	654
Deaths per 1,000 population	13.71
Deaths under 1 year of age	150
Deaths from:	
Appendicitis	2
Bronchitis	16
Cancer and other tumors	19
Cerebral hemorrhage	16
Cirrhosis of the liver	1
Congenital malformations	55
Diabetes	5
Diarrhea and enteritis (under 2 years of age)	82
Dysentery (amoebic)	2
Deaths from—continued:	
Dysentery (unclassified)	8
Gonorrhea	2
Heart diseases	19
Hookworm disease	9
Influenza	1
Leprosy	2
Malaria	31
Nephritis (acute)	5
Nephritis (chronic)	21
Pellagra	2
Pneumonia	29
Syphilis	48
Tetanus	3
Tuberculosis (all forms)	52
Typhoid fever	4
Violence	12

SWEDEN

Notifiable diseases—February 1937.—During the month of February 1937, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	5	Poliomyelitis	80
Diphtheria	20	Scarlet fever	1,155
Dysentery	4	Typhoid fever	4
Epidemic encephalitis	1	Undulant fever	10
Paratyphoid fever	3	Weil's disease	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for March 26, 1937, pages 372-385. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued April 30, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Argentina—Cordoba Province—Pilar.—During the period March 16–31, 1937, 1 case of plague with 1 death was reported in Pilar, Cordoba Province, Argentina.

Peru.—During the month of February 1937, plague was reported in Peru as follows: Lambayeque Department, 4 cases, 3 deaths; Libertad Department, 12 cases, 7 deaths; Lima Department, 5 cases, 3 deaths; including Lima City, 1 case; Piura Department, 2 cases.

Senegal—Dakar.—On April 6, 1937, 1 case of plague was reported in Dakar, Senegal.

Typhus Fever

On vessel (Polish).—On March 16, 1937 a Polish vessel arrived at Santos, Brazil, with typhus fever on board.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Matto Grosso State—Vista Alegre, 1 death February 20; Maracaju, rural districts—Brilhante, 1 case February 19; Matta Terra Amarella, February 10 to 14, 2 cases; Recordacao, February 11 to 13, 2 cases; Santa Gertrudis, February 8, 1 case; Sao Thomaz, February 16, 2 cases; Sete Voltas, February 4, 1 case. Minas Geraes State—Alfenas, February 26 to 27, 2 deaths; Areado, March 2, 1 death; Campos Geraes, March 5, 1 death; Lavras, February 28 to March 17, 3 deaths; Posto do Machado (first appearance), March 2, 1 death; San Sebastiao do Paraizo (first appearance) February 28, 1 death; Theophilo Ottoni, February 14, 1 death. Sao Paulo State—Jundiai, March 3 to 7, 2 deaths; Ribeirao Preto, March 8, 1 death. Localities showing the first appearance of yellow fever are as follows: Campinas, February 26, 1 death; Indaiatuba, February 23 to 25, 3 deaths; Itu, February 26 to March 1, 2 deaths; Junueri, February 27, 1 death; Parnaiba, February 15 to March 3, 8 deaths; Presidente Venceslao, February 14 to March 6, 5 deaths; Rancharia, March 6, 1 death. Acre Territory (first appearance); Xapury, January 31, 1 death.

Senegal.—Yellow fever has been reported in Senegal as follows: Khombole, Thies Circle, April 5, 1 case; Tivaouane, Tilmaka Subdivision, April 8, 1 case.

X

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

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SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FINAL QUARTER OF 1936 AND THE YEAR AS A WHOLE[1]

By DEAN K. BRUNDAGE, *Senior Statistician, United States Public Health Service, Division of Industrial Hygiene, National Institute of Health*

YEAR 1936

The frequency of 8-day or longer disabilities from sickness and nonindustrial accidents among the 157,294 male workers in the employ of 29 industrial concerns included in the sample of industrial employees for morbidity analysis in 1936 was higher than in 1935, which rate in turn was above that for the preceding year. In 1936 the incidence was 95.1 cases per 1,000 males, in 1935 it was 85.7, and in 1934 it was 79.3. Thus in 2 years the frequency of illness (for 8-day or longer cases) has increased 20 percent in this sample of the male industrial population. As compared with the average annual rate during the 5 years ending December 31, 1935, however, the 1936 incidence was higher by only 7 percent.

For diseases of the respiratory system, the 1936 rate exceeded that for 1935 by 17 percent and the 5-year average by 10 percent. Bronchitis and pneumonia occurred oftener in 1936 than in either of the two earlier periods under consideration. However, the number of new cases of respiratory tuberculosis per 1,000 male employees decreased appreciably from the 1935 and the 1931–35 incidence of this disease. If this sample of the population is representative, even lower rates of tuberculosis mortality than have occurred recently are presaged from the declining number of new cases.

The incidence of pneumonia (all forms) has increased appreciably during the past 2 years. In 1935 the rate was 15 percent higher, and in 1936 one-third higher than the average rate for the 5 years 1931–35. Since about one-fourth of the pneumonia cases occurring among workers below age 50 may terminate fatally, the serious nature of a high incidence rate of this disease is manifested.[2]

The influenza rate in 1936 was 22 percent above its 1935 frequency, but practically the same as the average rate during the 5 years 1931–35.

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[1] Report for the third quarter and the first 9 months of 1936 was published in the Public Health Reports for Jan. 29, 1937, pp. 127–129.

[2] Frequency of Pneumonia Among Iron and Steel Workers. Public Health Bulletin No. 202. Government Printing Office, Washington, D. C., 1932. P. 46.

As usual, the nonrespiratory diseases as a group showed less variation than the respiratory group. The nonrespiratory disease rate was definitely higher, however, in 1936 than in the preceding year or during the 5 preceding years as a whole. Among diseases of the digestive system the greatest proportionate increase was recorded for appendicitis, the recorded rate in 1936 being 4.4 cases per 1,000 males as compared with 3.8 in 1935 and 3.7 in the period 1931–35. There was no change in the frequency of diseases of the nervous system nor in the important circulatory and genitourinary disease groups, but the incidence of diseases of the skin and of the rheumatic group increased somewhat in 1936 over the frequencies recorded in the preceding year and the 5-year period.

For nonindustrial injuries the 1936 rate was 9 percent above the frequency recorded in 1935, but identical with the 5-year average rate.

FOURTH QUARTER OF 1936

During the first, second, and third quarters of 1936 the sickness frequency rate was only slightly higher than in the corresponding period of the preceding year. In the final quarter, however, the rate was markedly above the level of the last 3 months of 1935. Influenza increased 80 percent, pneumonia 20 percent. In the six respiratory disease categories listed in table 1, only tuberculosis showed no increase in frequency. The rate for nonrespiratory diseases as a whole was 17 percent higher than in the fourth quarter of 1935. An enhanced rate is shown for nonindustrial injuries, diseases of the stomach, appendicitis, the rheumatic group of diseases, genitourinary diseases other than nephritis, and diseases of the skin. A decreased incidence was recorded for diseases of the nervous system, for the serious diseases embraced in the group designated "diseases of the heart and arteries and nephritis," and for the epidemic and endemic diseases as a whole, influenza excepted. These groups, in addition to respiratory tuberculosis, constitute the only bright spots in the morbidity picture for the fourth quarter of 1936.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the fourth quarter and in the year 1936 compared with the corresponding periods of 1935. (Male morbidity experience of industrial companies which reported their cases to the U. S. Public Health Service)* [1]

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men				
	Fourth quarter of—		Full year of—		
	1936	1935	1936	1935	1931–35
Sickness and nonindustrial injuries [2]	103.5	82.0	95.1	85.7	89.2
Nonindustrial injuries	13.0	11.5	12.1	11.1	12.1
Sickness	90.5	70.5	83.0	74.6	77.1
Respiratory diseases	39.5	26.8	34.7	29.7	31.5
Bronchitis, acute and chronic (106)	5.8	4.3	5.0	3.9	3.5
Diseases of the pharynx and tonsils (115a)	4.8	4.4	4.9	5.0	4.7
Influenza and grippe (11)	18.3	10.2	15.8	12.9	15.9
Pneumonia, all forms (107–109)	2.4	2.0	2.7	2.3	2.0
Tuberculosis of the respiratory system (23)	.8	1.0	.8	1.0	1.0
Other respiratory diseases (104, 105, 110–114)	7.4	4.9	5.5	4.6	4.4
Nonrespiratory diseases	51.0	43.7	48.3	44.9	45.6
Diseases of the stomach, cancer excepted (117–118)	4.4	3.5	3.9	3.7	3.7
Diarrhea and enteritis (120)	1.3	1.3	1.4	1.2	1.2
Appendicitis (121)	4.1	3.6	4.4	3.8	3.7
Hernia (122a)	1.6	1.5	1.7	1.4	1.6
Other digestive diseases (115b, 116, 122b–129)	3.0	2.8	2.9	2.8	3.0
Rheumatic group, total	10.7	8.9	10.2	9.2	9.9
Rheumatism, acute and chronic (56–57)	4.7	3.4	4.5	4.0	4.7
Diseases of the organs of locomotion (156b)	3.4	3.1	3.3	2.8	3.0
Neuralgia, neuritis, sciatica (87a)	2.6	2.4	2.4	2.4	2.2
Neurasthenia and the like (part of 87b)	1.2	1.3	1.1	1.2	1.1
Other diseases of the nervous system (78–85, part of 87b)	1.2	1.5	1.2	1.3	1.3
Diseases of the heart and arteries and nephritis (90–99, 102, 130–132)	3.8	4.1	3.7	4.0	3.8
Other genito-urinary diseases (133–138)	3.1	2.3	2.5	2.6	2.4
Diseases of the skin (151–153)	3.8	2.7	3.1	2.7	2.8
Epidemic and endemic diseases except influenza (1–10, 12–22, 24–33, 36–44)	1.9	2.6	2.4	2.7	2.4
Ill-defined and unknown causes (200)	4.0	1.9	3.2	2.1	2.0
All other diseases (45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	6.9	5.7	6.6	6.2	6.7
Average number of males covered in the record	164,877	143,877	157,294	140,306	146,921
Number of companies included	29	29	29	29	-------

[1] In 1935 and 1936 the same companies are included. The rates for the years 1931–35 include 24 of these companies, which employed an average of 119,426 men during these years, or 81 percent of the 146,921 men representing the sample population for the 5 years.

[2] Exclusive of disability from the venereal diseases and a few numerically unimportant causes of disability.

STUDIES ON TRICHINOSIS

III. The Complex Clinical Picture of Trichinosis, and the Diagnosis of the Disease

By MAURICE C. HALL, *Professor of Zoology, Division of Zoology, National Institute of Health, United States Public Health Service*

In two recent papers, Hall and Collins (1937) have reported an incidence of 13.67 percent of trichinae in 300 cadavers from 11 hospitals at Washington, D. C., and Baltimore, Md., and summarized the results of previous investigations which, with their own, show the presence of trichinae in 222 of 1,778 cadavers, an indicated incidence of 12.5 percent, with not one of the 222 positive cases ever having had

a diagnosis of trichinosis in spite of the fact that trichinae were sometimes present in amounts up to almost 1,000 per gram of muscle. The authors have also correlated the incidence with factors present in geographic areas and various population groups. From the findings to date they draw the conclusions, which previous authors apparently hesitated to draw in specific terms, that the United States, so far as evidence is available, has the greatest problem of trichinosis of any country in the world, that it apparently involves millions of persons, and that trichinosis is a major public health problem in this country.

These conclusions are so widely at variance with previous beliefs in general, which are to the effect that trichinosis is rare and relatively unimportant, that one must either assume that the findings reported by 9 workers or groups of workers from 24 hospitals in 11 widely scattered cities are not significant, that these findings are usually not clinically significant, or else that our general background in regard to the picture of clinical trichinosis, our diagnostic methods, and our education, training, and preparation for the detection of trichinosis are definitely faulty.

The available figures on the incidence of trichinae in cadavers, without being precise in terms of percentages, indicate a high general incidence. The size of the samples on which incidence is considered is less important than that the samples be representative. The 1,778 diaphragms, on which the figure of 12.5 percent is based, have been collected from all sections of the country, and Hall and Collins (1937) have given several reasons why the percentages obtained to date are all lower than the actual incidence in the material examined.

The idea that the findings are not clinically significant finds no support in the quantitative data showing up to almost 1,000 trichinae per gram of diaphragm in some of these cases. Undoubtedly infestations with hundreds of trichinae per gram produce definite clinical symptoms.

The true explanation obviously lies in the alternative idea that our background of concepts of trichinosis is quite faulty, our knowledge inadequate, and our preparation for intelligent handling of the disease definitely unsatisfactory. Medical schools quite generally give the subject of parasitology only scanty and inadequate attention, and no medical subject is more neglected, a fact which is recognized by all physicians familiar with parasitology. In the subjects named in the essentials of an acceptable medical school, published in the Journal of the American Medical Association for August 29, 1936 (v. 107 (9); 684–685), parasitology is not mentioned, this subject receiving only incidental attention in other courses. From long acquaintance with hundreds of both veterinarians and physicians, I do not hesitate to say that veterinarians in general are much better informed regarding parasitology, both in theory and practice, than are physicians in

general. Twenty years ago both were equally uninformed, but within the period of 20 years all the veterinary colleges have established courses in parasitology and have greatly improved their teaching of this subject. In small-animal practice, a very important field of veterinary medicine, the treatment of parasitisms makes up fully 50 percent of the practice.

There are several reasons for this state of affairs. Domesticated animals cannot be surrounded by the safeguards with which mankind is surrounded. Sewerage systems and privies, our greatest sanitary safeguards, cannot be utilized by our animals, and all our grazing animals deposit their feces on the table, their pasture, from which they feed, an ideal set-up for maintaining parasitisms. The cooking of food, bathing, and similar conditions of life have only limited application so far as our animals are concerned. Meat inspection is intended to protect mankind, and the idea that it should protect our meat-eating animals is hardly expressed, much less accepted or practised. Lacking all these safeguards, our domesticated animals quite generally suffer from parasitisms of many sorts. Hence, it was not difficult to persuade the veterinarian to take an interest in parasitology, as the writer, who played a role in this matter, found out within the course of the first couple of years of active participation.

So far as the physician is concerned, we have been misled by the idea that parasitology is a phase of tropical medicine, and that tropical medicine is a matter that concerns the physician in the Tropics. Manson long ago expressed the idea that parasitisms were incidental concerns in the temperate regions and routine matters in the Tropics. Today, all physicians well informed in tropical medicine recognize that the diseases and parasites most prevalent in the Tropics are merely predominantly prevalent in the Tropics, but that almost all of them are plentifully present in temperate regions and should be known to physicians in those regions, that their prevalence in the Tropics is often correlated more with a general lower sanitary level in the Tropics than with climatic conditions, and that sanitary levels over much of the temperate regions are low enough to favor these tropical diseases and parasites. They point out that sufferers from these diseases and parasites are present in our own country in relatively large numbers, numbers increasing as modern transportation develops, and that these sufferers receive inadequate treatment by the vast majority of physicians in the United States because of the physicians' unfamiliarity with so-called tropical diseases. Mackie (1935) states that "New York City offers a large and relatively unexplored opportunity in tropical medicine," and that Fuelleborn had expressed the belief that it "offered as wide a variety of tropical diseases as any in the world."

The two worm parasites which quite definitely surmount our sanitary barriers in the United States are trichinae and pinworms, and

these parasites are relatively or almost entirely neglected in our medical education and training. Both of them have had inadequate research study. If infestations with these two parasites were generally recognized, it would be found that a considerable amount of trichinosis is already being dealt with by physicians without the disease being recognized, and a considerable practice in dealing with pinworms would be developed where it is now being overlooked.

The most serious gap in our knowledge of trichinosis, so far as medical practice is concerned, is our ignorance of the clinical picture. The classical picture, as given in the textbooks and reference books, is greatly oversimplified and represents only a composite picture as ascertained, for the most part, from epidemics of severe clinical trichinosis. Ransom (1915) has well said: "An important characteristic of trichinosis, whether mild or severe, is the lack of regularity in its course", and Bloch (1916) has referred to its protean character. Like any oversimplified, highly generalized, composite picture, the customary book description represents a relatively rare picture.

It is even probable that there is a changing picture which follows from various changes in modern modes of life, including changes in the methods of killing swine and preparing pork products. Hall and Collins (1937) have already called attention to this in noting that Ransom (1915) appears to have been the first to recognize a dilution factor in the present-day preparation of sausage and similar products from trimmings of many swine, perhaps hundreds, with a resultant distribution through the product of the trichinae from possibly one hog in a hundred hogs, so that the chance of getting trichinae from such a product, when eaten raw, is greatly increased, whereas the likelihood of getting clinical trichinosis is greatly decreased. Simultaneously, the likelihood of repeated light infestations is greatly increased, a thing which should be considered in connection with modern aspects of trichinosis. How significant these repeated light infestations may be to the health of the individual is unknown. Under older methods of killing swine on the farm or in small slaughter houses, the chance of getting trichinae from eating pork or pork products from swine of which one percent was infested would be very small, but the chance that any infestation would result in clinical trichinosis would be very great, and epidemics from this form of slaughter still appear to make up the greater part of the epidemics in the United States. Obviously, the chance of reinfection from such a source is relatively small, but the chance that any reinfection will again result in clinical trichinosis is very great.

Ransom (1915) has stated that trichinosis is difficult to diagnose, and we lay down the general thesis that we have as yet no adequate clinical picture of trichinosis available to the clinician. To establish that thesis, we consider first the basic facts underlying the occurrence

of trichina infestations. Trichinosis, as a disease, is conditioned by the presence of a nematode parasite, *Trichinella spiralis*, in the following forms: As infective larvae entering the digestive tract; as older larvae and adults in the lumen of the intestine; as adults among and partly within the villi; as young larvae circulating through the lymphatic and the systemic and pulmonary circulation, and entering such tissues as the lymph nodes and glands, the brain, the heart muscles, the striated, voluntary, somatic, or skeletal muscles, and, to some extent, other tissues and various cavities, being reported from the lungs, liver, bile, peritoneal cavity, pleural cavity, pericardial cavity, pancreas, kidney, bone marrow, placenta, human milk, and the pus from the external ear and from a furuncle; and as larvae degenerating and disintegrating in various sites, such as the heart, and encysting, and ultimately calcifying, in the skeletal muscles.

With an etiology of this type, the clinical effects produced by the worm, in general, will be conditioned by the following factors: (1) In part by the number of worms present; (2) in part by the size of the patient; (3) in part by the tissues invaded; and (4) in part by the factors of physical condition, resistance, concomitant pathologic conditions present, and other features of the individual attacked by the parasite. Looked at in this manner, trichinosis becomes a highly complicated and little studied disease, but if we are to give it adequate consideration we must look at it in this light, and must regard the complete classical picture as something which has little more existence than has the "average man", and which is useful only as a concept to be applied with numerous reservations and with an eye to possible and probable modifications of the general pattern.

As regards the number of trichinae present, it is obvious that there may be a minimum of one infective larva swallowed, and that this larva, whether male or female, may develop to one adult in the lumen of the intestine and among the villi, with no subsequent production of any larvae whatever. Since Roth (1935) has recovered four trichina larvae from a composite sample of four guinea pig fetuses, after digestion and examination with the Baermann apparatus, it seems probable that as a result of prenatal infection a person may have as little as one encysted larva in the muscles. So far as numbers are concerned, we may say with confidence that at this extreme of light infection, the presence of one adult or one larva does not produce clinical trichinosis. Very light infestations of approximately this degree constitute zoological trichinosis as opposed to clinical trichinosis.

At the other extreme, Roth (1935) has reported the astounding number of 10,000 larvae per gram of muscle in an artificially infected guinea pig. In similar artificial infections, workers have developed thousands of adults in the digestive tract of experiment animals. Of such extreme cases, with their accompaniment of innumerable larvae

in the lymph, blood, and various tissues, one may say with entire confidence that the presence of these large numbers of worms ensures the production of severe clinical trichinosis.

As we move from either one of these extremes toward the other, we soon run into unknown territory. We are sure that our necropsy cases of infestation with approximately 1,000 larvae per gram of diaphragm muscle represent former cases of clinical trichinosis, and suspect that those with only one larva per 100 grams of diaphragm muscle probably do not represent cases of clinical trichinosis; but we have no adequate data on which to make correlations and to conclude anything, for instance, about a case of infestation with one larva per gram of diaphragm muscle. Trichinosis has had so little adequate study that there is an almost complete lack of quantitative data covering the number of trichinae present in a weighed sample of a selected muscle from the hundreds of clinical cases which have come to necropsy. If these data were available at this time they could be correlated to great advantage with the case histories of individuals in incidence studies and in various other ways. Since we do not have them, we should obtain them as soon as possible, and pathologists could render a great service by at least making a direct microscopic examination of a press preparation of one gram of diaphragm muscle, taken from near the tendinous portion, from each case of clinical trichinosis coming to necropsy, and recording, for the benefit of investigators, the results in terms of trichinae per gram.

While a fund of information as to the number of trichinae per gram would not, of itself, develop our picture of clinical trichinosis, this information, coupled with the case history and a presentation of the clinical and post-mortem features actually present in all cases so studied, would start us on the road to an understanding of this practically unstudied subject. There is ample evidence that the clinical picture is highly variable, and these quantitative data would clarify the picture as to the extent to which intensity of infection is the responsible factor, or one of the factors, in the production of certain symptoms.

The second factor, the size of the patient, has a bearing on the matter, since any given number of worms concentrated in a small terrain will give a more intense invasion than the same number of worms scattered over a larger terrain. Thus the concentration in a child weighing 50 pounds should be four times as great as in an adult weighing 200 pounds. While children are said to show milder clinical conditions than adults, as a rule, the reason is unknown, and might be because of eating smaller amounts of infected pork. In exceptional instances, children may have fulminating and rapidly fatal cases, such as the case reported by Sobel (1936), of a child 4 years old who died after an illness of less than 4 days.

The third factor which conditions our clinical picture of trichinosis, is the matter of tissues invaded. As already noted, the worms, in their various stages, are in the intestinal lumen, among and in the villi, in the lymph and blood stream, and, either temporarily or permanently, in the lymph nodes and glands, brain, heart, skeletal muscles, and other tissues. In these sites an adequate number of worms may produce lesions or such other pathologic conditions as dysfunction with the appropriate associated symptoms. In recent years there have been some studies showing that the oversimplified picture of trichinosis as presenting gastrointestinal symptoms associated with larvae swallowed and adults developing and entering villi, of eosinophilia associated with larvae in the blood stream and muscles, of suborbital edema associated with larval worms in the eye muscles and in eye capillaries, of fever and myositis associated with invasion of skeletal muscles, and of pneumonia associated, somewhat uncertainly, with toxic products of damaged muscle tissue, or various other conditions is inadequate. Investigators have recently called attention to the heart lesions caused by the invasion of the myocardium, the lesions persisting after the worms have died, degenerated, and disappeared from the heart muscles, in which they cannot and do not encyst. Others have called attention to the symptoms of nervous derangement associated with the invasion of the brain, its coverings, and the cerebrospinal fluid, an association known for some time but too little studied.

In this connection we summarize briefly some of the correlations between tissues invaded and the symptoms associated with the invasion, adding to each some of the conditions with which trichinosis presenting these symptoms may be, and in practically all cases has been, confused. Many of these symptoms are well summarized by Spink and Augustine (1935). Some of these symptoms and diagnoses are associated with the effects of the parasite in several locations rather than in just the location given here.

Larvae and adults in intestinal lumen and villi.—Symptoms: Gastro-enteritis, diarrhea, constipation, or successive constipation and diarrhea, "vegetable-soup stools", often with Charcot-Leyden crystals, nausea, vomiting, abdominal pain of varying degree and in various locations, cold sweats, hot flushes, intestinal hemorrhages, and fever; *diagnosed as* typhoid fever, paratyphoid fever, typhus fever, cholera, cholera morbus, intestinal influenza, malaria, ptomaine poisoning, food poisoning, gastro-enteritis of unknown origin, gastrointestinal catarrh, appendicitis, colitis, peptic ulcer, gall bladder involvement, and acute alcoholism.

Larvae in blood stream and muscles.—Symptoms: Eosinophilia, oligemia, oligocythemia, hypotension, leucocytosis, splenic enlargement, anemia absent or else present in varying degree, edema in

various parts of body (especially suborbital), dyspnoea, orthopnoea, diaphragmatic breathing, pleurisy, cough, hiccough, asthma, hemoptysis, pneumonia, dysphagia, aphonia, laryngitis, myositis, myalgia, furunculosis, cutaneous eruptions, urticaria, rose spots, desquamation, sweating, apathy, lassitude, somnolence or insomnia, anorexia, conjunctivitis, corneal ecchymoses, mydriasis, photophobia, diplopia, pulse often slow by comparison with height of fever, albuminuria present or absent, indicanuria present or absent, positive diazo reaction, casts in urine, positive Kernig's sign, loss of patellar and Achilles' tendon reflexes, neuritis, rigor, persistent or remittent fever, and menstrual disturbances; *diagnosed as* arthritis, rheumatism, rheumatic fever, dermatomyositis, pelvic inflammatory disease, pleurisy, asthma, upper respiratory infection, pneumonia, laryngitis, conjunctivitis, nephritis, multiple neuritis, intercostal neuritis, angioneurotic edema, syphilis, tuberculosis, undulant fever, tetanus, scarlet fever, measles, mumps, influenza, frontal sinusitis, erysipelas, and lead poisoning.

Larvae in heart.—Symptoms: Myocarditis, systolic murmur at apex, cardiac lability, and dicrotic pulse; *diagnosed as* myocarditis, rheumatic myocarditis, endocarditis, or other heart diseases.

Larvae in brain and meninges.—Symptoms: Encephalitis, meningitis, cephalalgia, hemiplegia, delirium, and coma; *diagnosed as* encephalitis, meningitis, tuberculous meningitis, and poliomyelitis.

From the above it appears that diagnoses of approximately 50 disease conditions may be made, and in practically all cases have been made, when the actual basis of these conditions is the presence of trichinae. Undoubtedly, this list could be materially enlarged from a more extensive search of the literature or a more adequate knowledge of the polymorphic manifestations of trichinosis. Somewhere among the diagnoses listed, and others not listed, we must look for the large number of cases of trichinosis which necropsy studies show exist in the United States, and which are being missed in our diagnoses. In general, the diagnoses made are based on symptomatology rather than on established etiology.

Even in severe clinical trichinosis, part of the classical picture may be omitted or suppressed, and the order of events may be irregular. The first stage, that of gastrointestinal disturbances, is absent in many cases. Visible symptoms may first develop or be noted in from a few hours to over 40 days after the apparent time of infection. Eosinophilia may be absent if there is a concomitant bacterial infection or may decrease if a bacterial infection supervenes, as Spink (1934) has demonstrated experimentally; and with peritonitis present the eosinophiles may never rise above 3 percent, the blood picture showing a high neutrophile count indicative of bacterial infection. While there is a customary gradual rise to a high eosinophile level, followed by a gradual decline, the level may never be high, the peak

may be reached early or late in the course of the disease, there may be an irregular rise and fall, and eosinophilia may persist at some such level as 10 percent for long periods after recovery. The myalgia may be generalized or definitely localized and, if localized, may mislead the clinician into a diagnosis of intercostal neuritis or neuritis of other sorts, and of rheumatic conditions, the latter especially plausible in those cases in which myalgia persists for a year or more. Children usually have the disease in atypical forms, with a low mortality rate, although some rare cases in children are of a fulminating type which is fatal in less than a week. The eye conditions often predominate to the extent that the patient goes first to an ophthalmologist, and since a careful examination usually shows little of a definite character to account for the trouble, these cases may be very perplexing. Heart conditions may obscure the entire picture of trichinosis. Predominant nervous conditions suggestive of meningitis are given little consideration as possibly suggestive of trichinosis. Added to all this is the too common denial of the eating of raw pork or pork products, even by orthodox Jews who contend, sometimes quite honestly, that they have never eaten meat that is not kosher, but who, nevertheless, show trichinae on biopsy in addition to definite symptoms of trichinosis.

The fourth factor, that of the patient's individual condition, resistance, and concomitant pathologic conditions, modifies the picture of trichinosis as it does the picture of other diseases. Theobald Smith (1934), in his excellent work on parasites and disease published just before his death, notes that in any invasion of a host by a parasite, the parasite brings to the conflict its appropriate weapons of offense and defense, and the host in turn brings to bear its weapons for the destruction of the parasite and its defense for the immobilization of the parasite and its own protection. This highly useful concept needs only to be stated to make clear its application to trichinosis. The war rages, with its gains and losses in this or that part of the host terrain; and from the conflict the patient emerges triumphant, perhaps with little injury, perhaps scarred and doomed to a shortened life from wounds sustained, or goes down in defeat and death. Victory or defeat, wounds and healing, are determined by the interplay of the weapons of offense and defense wielded by both combatants. Obviously, such a weak spot in the host defenses as an already damaged heart may turn the tide of battle in favor of the parasite, with the war terminating in the death of the patient from heart disease with no suspicion, on the part of the physician, of the parasite that worked the essential injury.

Between light infestations, producing zoological but not clinical trichinosis, and heavy infestations, producing severe clinical trichinosis, there is the unstudied no-man's land of infestations of inter-

mediate degrees of all sorts, which infestations must produce atypical clinical trichinosis of unknown symptomatology. The study of these atypical cases, making up probably the majority of all cases of trichina infestation, so far as data are available for estimating this calls for the cooperation of many pathologists, clinicians, and parasitologists, and for a lot of quantitative studies which have never been made. The material is obviously at hand almost anywhere in the United States, and notably abundant in such localities as the New York-New England area and on the west coast; it is plentiful in Washington. It is the purpose of this paper to invite attention to the problem and its importance, and to supply some background of information to indicate the direction along which investigations might proceed. At the same time, it is hoped that the emphasis on the inadequate nature of the classical picture of trichinosis will aid in the development of a better type of diagnosis.

At the present time we have, in addition to the symptomatology of trichinosis, such aids to diagnosis as the biopsy, the examination of stools for trichinae, the search for trichina larvae in the blood and cerebrospinal fluid, and the skin test and precipitin test. As regards the biopsy, the tissue excised should be examined as a press preparation and not sectioned, since the press preparation is much more certain to detect trichinae present and permits of a much more rapid determination of the presence or absence of trichinae. The biopsy method has the limitation that it is negative in the early stage of the disease, and even when trichinae have just arrived in the muscles they are much less likely to be detected than when they have had time to grow and encyst; thereafter they give dependable information provided the biopsy specimen comes from an infested muscle and the picture is not complicated by trichinae present from a previous infection and hence not correlated with the clinical symptoms being considered at the time of the biopsy.

The examination of stools for trichinae is not established at this time as a valuable aid in diagnosis. The weight of evidence is to the effect that it is of little or no value.

As regards the presence of trichina larvae in the blood and cerebrospinal fluid, this has two time limitations. The larvae are present, although not always easy to find, about one week after infection, and they persist throughout the period of larval production by females in the villi, having been detected in the blood over a period of 3 weeks, but when looked for too early or too late they will be absent even though the case is clinical trichinosis.

As regards the skin tests, they do not give positive reactions in trichinosis as early as is desirable, being positive, in certain dilutions, in 11 days, according to McCoy, Miller, and Friedlander (1933), or 14 days, according to Spink and Augustine (1935), and the test being

positive, and hence potentially misleading, for over 7 years after clinical recovery. McCoy, Miller, and Friedlander have reported the test as somewhat nonspecific in giving positive reactions in cases of infestation with the whipworm, *Trichuris trichiura*, a nematode somewhat closely related to *Trichinella spiralis*, but Theiler, Augustine, and Spink (1935) have taken exception to one basis of their assumptions, namely, that trichinosis is apparently absent in the South, where the work was done, and Hinman's (1936) report of an incidence of 3.5 percent of trichinae in cadavers at New Orleans, a figure which is probably too low because of the use of only one technique in the study, supports the exception.

The precipitin test becomes positive even later than the skin test, usually about the end of the fourth week after infection. It may remain positive for a year after infection, but how much longer it may remain positive is unknown. Bachman, Rodríguez Molina, and Gonzales (1934) report various conditions which give nonspecific and anomalous reactions. Both the precipitin test and the skin test need more careful study in titration, standardization, preparation of antigen, and interpretation of reaction. A test which will permit of earlier diagnosis is evidently desirable, and will probably be developed. In the meantime and pending improvements, these diagnostic tests should be used when any of the cardinal symptoms of trichinosis, such as fever and marked eosinophilia, or suborbital edema and myalgia, are present. So far as available material permits, the National Institute of Health will cooperate with physicians in making such tests and affording information in regard to them. What are at present regarded as the cardinal symptoms—a history of the eating of raw pork products or raw or undercooked pork, gastrointestinal disturbances, eosinophilia, edema (usually suborbital), high fever, myositis, and pneumonia—must continue to be regarded as valuable clues to diagnosis, but it must be kept in mind that they may be present in varying combinations and that a consideration of other symptoms may be found essential, especially for the diagnosis of the atypical trichinosis which probably makes up the large bulk of cases.

SUMMARY

Since examinations of 1,778 cadavers at 24 hospitals in 11 places in the United States indicate an incidence of at least 12.5 percent of trichinae, with not 1 case out of 222 positive cases having been diagnosed as trichinosis at any time, it is evident that our knowledge of the polymorphic picture of clinical trichinosis is inadequate and that we need more information in regard to diagnosis.

Trichinosis, as a disease, is determined by the presence of larval and adult worms in the intestine, and of larvae in the lymph, blood,

lymph nodes and glands, brain, heart, voluntary muscles, and other tissues and certain cavities. The disease is conditioned by the numbers of worms present, the size of the patient, the tissues invaded, and the individual patient's physical condition, resistance, and concomitant pathologic conditions present.

As regards numbers of worms present, we are certain that such large numbers of larvae as 1,000 per gram of muscle will produce severe clinical trichinosis, and suspect that such small numbers as one larva per 100 grams will not produce clinical trichinosis, but we have no data on which to judge intermediate degrees of infestation. Within this range of intermediate infestation there is undoubtedly a large group of cases of atypical clinical trichinosis, much larger than the group of so-called typical cases, which is unknown and unstudied.

As regards the size of the patient, the same number of larvae in a small individual will give a higher concentration of larvae per gram, so that a given number of worms may cause, relatively, four times as much damage, or more, in one individual as they will cause in another.

As regards tissues invaded, the wide range of tissues damaged gives rise to numerous cases in which the predominant symptoms are those of diseases of infectious sorts other than trichinosis, of heart disease, of respiratory disease terminating in pneumonia, often fatal, of meningitis and other disturbances of the nervous system, of eye lesions, and other conditions. Approximately 50 disease conditions confused with trichinosis are listed.

As regards the condition of the individual patient, we expect the most variegated clinical picture associated with weaknesses in various organs, sometimes with death so closely correlated with the attack on one weak organ, such as the heart, that trichinosis is never suspected.

To clarify our picture of trichinosis, especially of atypical clinical cases caused by infestations of intermediate extent, as opposed to very heavy or very light infestations, calls for much research and cooperation by pathologists, clinicians, and parasitologists. Quantitative studies are especially necessary.

The various laboratory aids in diagnosis are noted, and their limitations pointed out.

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MORTALITY STATISTICS FOR THE UNITED STATES, 1935

Deaths (exclusive of stillbirths) and death rates, by cause, for 1935 and comparison with 1930 and 1934

According to figures compiled by the Bureau of the Census, Department of Commerce,[1] there were 1,392,752 deaths from all causes (exclusive of stillbirths) in the United States in 1935, representing a mortality rate of 10.9 per 1,000 estimated population, a decrease as compared with 1934, when 1,396,903 deaths occurred, giving a mortality rate of 11.0 per 1,000. The rates for 1935, 1934, and 1933 are the lowest in the 6-year period 1930–35. The death rate for 1933 (10.7 per 1,000) was the lowest rate recorded since the annual collection of mortality statistics was begun in 1900.

The accompanying table[1] gives the number of deaths and the death rates for the United States for 1935, and comparison with 1930 and 1934, for each cause according to the titles of the International List of Causes of Death.[2] The figures for the 2 later years include the entire United States; those for 1930 include all States except Texas, which was admitted to the death registration area in 1933.

[1] Vital Statistics—Special Reports, Vol. 3, No. 10, pp. 58–64. Department of Commerce, Bureau of the Census.

[2] The detailed causes of death in the Supplemental Classification of Accidents (201–214) and data for the years 1931–33, given in the Census report, are omitted here.

*Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935**

International list no.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	Total deaths (all causes)	1,392,752	1,396,903	1,343,356	1,092.2	1,103.2	1,133.9
	I. INFECTIOUS AND PARASITIC DISEASES	146,840	148,124	162,326	115.1	117.0	137.0
1	Typhoid fever	3,442	4,162	5,610	2.7	3.3	4.7
2	Paratyphoid fever	89	75	88	.1	.1	.1
3	Typhus fever	80	86	33	.1	.1	(1)
4	Relapsing fever	2	1	3	(1)	(1)	(1)
5	Undulant fever	98	65	53	.1	.1	(1)
6	Smallpox	25	24	165	(1)	(1)	.1
7	Measles	3,907	6,986	3,820	3.1	5.5	3.2
8	Scarlet fever	2,718	2,524	2,279	2.1	2.0	1.9
9	Whooping cough	4,753	7,518	5,707	3.7	5.9	4.8
10	Diphtheria	3,901	4,159	5,822	3.1	3.3	4.9
11	Influenza	28,230	21,868	23,066	22.1	17.3	19.5
	Respiratory complications specified	18,878	13,966	13,734	14.8	11.0	11.6
	Respiratory complications not specified	9,352	7,902	9,332	7.3	6.2	7.9
12	Cholera	------	------	------	------	------	------
13	Dysentery	2,436	3,373	3,356	1.9	2.7	2.8
	Amebic	282	362	225	.2	.3	.2
	Bacillary	725	974	610	.6	.8	.5
	Unspecified or due to other causes	1,429	2,037	2,521	1.1	1.6	2.1
14	Plague	------	2	------	------	(1)	------
	Buboric	------	2	------	------	(1)	------
	Pneumonic	------	------	------	------	------	------
	Septicemic	------	------	------	------	------	------
	Unspecified	------	------	------	------	------	------
15	Erysipelas	2,106	1,947	2,508	1.7	1.5	2.1
16	Acute poliomyelitis, acute polioencephalitis	1,040	852	1,370	.8	.7	1.2
17	Lethargic or epidemic encephalitis	857	923	1,062	.7	.7	.9
18	Epidemic cerebrospinal meningitis	2,657	1,272	4,211	2.1	1.0	3.6
19	Glanders	2	2	1	(1)	(1)	(1)
20	Anthrax (bacillus anthracis) malignant pustule	10	9	15	(1)	(1)	(1)
21	Rabies	77	80	60	.1	.1	.1
22	Tetanus	1,057	1,226	1,287	.8	1.0	1.1
23-32	Tuberculosis (all forms)	70,080	71,609	84,741	55.0	56.6	71.5
23	Respiratory system	63,488	64,706	75,120	49.8	51.1	63.4
24	Meninges and central nervous system	1,963	2,109	2,995	1.5	1.7	2.5
25	Intestines and peritoneum	1,431	1,579	2,554	1.1	1.2	2.2
26	Vertebral column	730	738	883	.6	.6	.7
27	Bones and joints (vertebral column excepted)	360	398	517	.3	.3	.4
	Bones	138	133	205	.1	.1	.2
	Joints	222	265	312	.2	.2	.3
28	Skin and subcutaneous cellular tissue	36	27	37	(1)	(1)	(1)
29	Lymphatic system (bronchial, mesenteric, and retroperitoneal glands excepted)	171	150	210	.1	.1	.2
30	Genitourinary system	566	569	642	.4	.4	.5
31	Other organs	94	96	146	.1	.1	.1
32	Disseminated tuberculosis	1,241	1,237	1,637	1.0	1.0	1.4
	Acute	1,096	1,095	1,429	.9	.9	1.2
	Chronic	19	8	29	(1)	(1)	(1)
	Unspecified	126	134	179	.1	.1	.2
33	Leprosy	25	32	27	(1)	(1)	(1)
34	Syphilis	11,590	11,726	10,554	9.1	9.3	8.9
35	Gonococcus infection and other venereal diseases	853	1,051	1,087	.7	.8	.9
36	Purulent infection, septicemia (nonpuerperal)	1,149	928	1,081	.9	.7	.9
37	Yellow fever	------	------	------	------	------	------
38	Malaria	4,435	4,520	3,403	3.5	3.6	2.9
39	Other diseases due to protozoal parasites	78	52	43	.1	(1)	(1)
40	Ankylostomiasis	18	24	32	(1)	(1)	(1)
41	Hydatid cysts	21	26	23	(1)	(1)	(1)
	Liver	16	18	15	(1)	(1)	(1)
	Other organs	5	8	8	(1)	(1)	(1)
42	Other diseases caused by helminths	122	107	119	.1	.1	.1
43	Mycoses	267	287	237	.2	.2	.2

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	I. INFECTIOUS AND PARASITIC DISEASES—Continued.						
44	Other infectious and parasitic diseases	715	608	463	0.6	0.5	0.4
	Chicken-pox	193	177	152	.2	.1	.1
	German measles	148	47	21	.1	(1)	(1)
	Others under this title	374	384	290	.3	.3	.2
	II. CANCERS AND OTHER TUMORS	144,065	140,771	120,956	113.0	111.2	102.1
45-53	Cancer and other malignant tumors	137,649	134,428	115,265	107.9	106.2	97.3
45	Of the buccal cavity and pharynx	4,905	5,009	4,554	3.8	4.0	3.8
	Lip	727	712	586	.6	.6	.5
	Tongue	1,076	1,056	947	.8	.8	.8
	Mouth	550	555	439	.4	.4	.4
	Jaw	999	1,053	1,051	.8	.8	.9
	Other and unspecified parts of the buccal cavity	600	611	520	.5	.5	.4
	Pharynx	953	1,022	1,011	.7	.8	.9
46	Of the digestive tract and peritoneum	66,461	65,476	57,812	52.1	51.7	48.8
	Esophagus	2,256	2,243	1,896	1.8	1.8	1.6
	Stomach and duodenum	27,104	26,869	25,408	21,3	21.2	21.4
	Intestines (except duodenum, rectum, anus)	14,465	14,105	10,996	11.2	11.1	9.3
	Rectum and anus	7,061	6,740	5,195	5.5	5.3	4.4
	Liver and biliary passages	10,479	10,668	10,388	8.2	8.4	8.8
	Pancreas	4,118	3,775	2,969	3.2	3.0	2.5
	Mesentery and peritoneum	950	999	895	.7	.8	.8
	Others under this title	28	77	65	(1)	.1	.1
47	Of the respiratory system	6,201	5,473	3,848	4.9	4.3	3.2
	Larynx	1,152	1,100	983	.9	.9	.8
	Lungs and pleura	4,356	3,877	2,653	3.4	3.1	2.2
	Other respiratory organs	693	496	212	.5	.4	.2
48	Of the uterus	15,853	15,635	14,132	12.4	12.3	11.9
49	Of other female genital organs	3,345	3,271	2,290	2.6	2.6	1.9
	Ovary and Fallopian tube	2,795	2,676	1,833	2.2	2.1	1.5
	Vagina and vulva	509	545	409	.4	.4	.3
	Other female genital organs	41	50	48	(1)	(1)	(1)
50	Of the breast	13,226	13,171	10,912	10.4	10.4	9.2
51	Of the male genitourinary organs	11,702	11,342	8,661	9.2	9.0	7.3
	Kidneys and suprarenals (male)	1,178	1,149	924	.9	.9	.8
	Bladder (male)	3,014	2,825	2,512	2.4	2.2	2.1
	Prostate	6,765	6,578	4,648	5.3	5.2	3.9
	Testes	412	452	270	.3	.4	.2
	Scrotum	34	30	30	(1)	(1)	(1)
	Other male genitourinary organs	299	308	277	.2	.2	.2
52	Of the skin	3,391	3,315	3,019	2.7	2.6	2.5
53	Of other or unspecified organs	12,565	11,736	10,037	9.9	9.3	8.5
	Kidneys and suprarenals (female)	870	865	705	.7	.7	.6
	Bladder (female)	1,485	1,351	1,172	1.2	1.1	1.0
	Brain	1,141	1,164	804	.9	.9	.7
	Bones (except jaw)	1,764	1,832	1,611	1.4	1.4	1.4
	Other or unspecified organs	7,305	6,524	5,745	5.7	5.2	4.8
54	Nonmalignant tumors	4,063	4,500	3,734	3.2	3.6	3.2
	Ovary	151	183	96	.1	.1	.1
	Uterus	2,535	2,707	2,504	2.0	2.1	2.1
	Other female genital organs	9	8	13	(1)	(1)	(1)
	Brain	805	941	611	.6	.7	.5
	Other organs	563	661	510	.4	.5	.4
55	Tumors of which the nature is not specified	2,353	1,843	1,957	1.8	1.5	1.7
	Ovary	48	18	41	(1)	(1)	(1)
	Uterus	22	12	24	(1)	(1)	(1)
	Other female genital organs	2	3	5	(1)	(1)	(1)
	Brain	1,622	1,358	1,439	1.3	1.1	1.2
	Other organs	659	452	448	.5	.4	.4
	III. RHEUMATIC DISEASES, NUTRITIONAL DISEASES, DISEASES OF THE ENDOCRINE GLANDS, AND OTHER GENERAL DISEASES	42,793	42,568	41,214	33.6	33.6	34.8
56	Acute rheumatic fever	2,238	2,330	2,920	1.8	1.8	2.5
57	Chronic rheumatism, osteoarthritis	1,721	1,695	1,566	1.3	1.3	1.3
58	Gout	2	2	7	(1)	(1)	(1)

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	III. RHEUMATIC DISEASES, NUTRITIONAL DISEASES, DISEASES OF THE ENDOCRINE GLANDS, AND OTHER GENERAL DISEASES						
59	Diabetes mellitus	28,364	28,000	22,528	22.2	22.1	19.0
60	Scurvy	30	36	42	(1)	(1)	(1)
61	Beriberi	7	5	1	(1)	(1)	(1)
62	Pellagra	3,543	3,602	6,333	2.8	2.8	5.3
63	Rickets	261	292	537	.2	.2	.5
64	Osteomalacia	12	21	11	(1)	(1)	(1)
65	Diseases of the pituitary body	90	117	59	.1	.1	(1)
66	Diseases of thyroid and parathyroid glands	4,379	4,228	4,797	3.4	3.3	4.0
	Simple goiter	226	247	318	.2	.2	.3
	Exophthalmic goiter	3,624	3,502	4,004	2.8	2.8	3.4
	Myxedema and cretinism	273	255	162	.2	.2	.1
	Tetany	108	129	127	.1	.1	.1
	Others under this title	148	95	186	.1	.1	.2
67	Diseases of the thymus gland	1,323	1,369	1,538	1.0	1.1	1.3
68	Diseases of the adrenals (Addison's disease, not specified as tuberculous)	379	347	308	.3	.3	.3
69	Other general diseases	444	524	567	.3	.4	.5
	IV. DISEASES OF THE BLOOD AND BLOOD-MAKING ORGANS	10,069	10,250	9,235	7.9	8.1	7.8
70	Hemorrhagic conditions	836	825	702	.7	.7	.6
	Primary purpuras	582	534	594	.5	.4	.5
	Hemophilia	254	291	108	.2	.2	.1
71	Anemias	3,481	3,943	4,411	2.7	3.1	3.7
	Pernicious anemia	2,935	3,374	3,908	2.3	2.7	3.3
	Other anemias	546	569	503	.4	.4	.4
72	Leukemias and pseudoleukemias	5,186	4,915	3,756	4.1	3.9	3.2
	True leukemias	3,552	3,403	2,543	2.8	2.7	2.1
	Pseudoleukemias (Hodgkin's disease)	1,634	1,512	1,213	1.3	1.2	1.0
73	Diseases of the spleen	409	430	328	.3	.3	.3
74	Other diseases of the blood and blood-making organs	157	137	38	.1	.1	(1)
	V. CHRONIC POISONINGS AND INTOXICATIONS	3,611	3,921	4,439	2.8	3.1	3.7
75	Alcoholism (acute or chronic)	3,349	3,655	4,158	2.6	2.9	3.5
76	Chronic poisoning by other organic substances	106	123	153	.1	.1	.1
	Occupational	7	6	3	(1)	(1)	(1)
	Others under this title	99	117	150	.1	.1	.1
77	Chronic poisoning by mineral substances	156	143	128	.1	.1	.1
	Lead	130	118	101	.1	.1	.1
	Occupational (except lead)	13	6	14	(1)	(1)	(1)
	Others under this title	13	19	13	(1)	(1)	(1)
	VI. DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE	135,065	134,365	132,841	105.9	106.1	112.1
78	Encephalitis (nonepidemic)	1,527	1,527	1,396	1.2	1.2	1.2
79	Meningitis	2,763	2,360	3,048	2.2	1.9	2.6
	Simple meningitis	2,337	2,094	2,485	1.8	1.7	2.1
	Nonepidemic cerebrospinal meningitis	426	266	563	.3	.2	.5
80	Progressive locomotor ataxia (tabes dorsalis)	942	1,151	1,306	.7	.9	1.1
81	Other diseases of the spinal cord	3,267	3,137	3,278	2.6	2.5	2.8
82	Cerebral hemorrhage, cerebral embolism and thrombosis	109,058	108,110	105,317	85.5	85.4	88.9
	Cerebral hemorrhage	96,938	97,148	95,308	76.0	76.7	80.4
	Cerebral embolism and thrombosis	7,375	6,392	4,678	5.8	5.0	3.9
	Softening of brain	699	720	660	.5	.6	.6
	Hemiplegia and other paralysis, cause unspecified	4,046	3,850	4,671	3.2	3.0	3.9
83	General paralysis of the insane	4,588	4,805	4,816	3.6	3.8	4.1
84	Dementia praecox and other psychoses	1,383	1,468	1,627	1.1	1.2	1.4
85	Epilepsy	2,743	2,913	3,080	2.2	2.3	2.6
86	Convulsions (under 5 years)	764	774	1,164	.6	.6	1.0

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number 1935	Number 1934	Number 1930	Rate per 100,000 estimated population 1935	Rate 1934	Rate 1930
	VI. DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE—Contd.						
87	Other diseases of the nervous system	3,854	3,929	3,742	3.0	3.1	3.2
	Neuralgia and neuritis	230	239	294	.2	.2	.2
	Others under this title	3,624	3,690	3,448	2.8	2.9	2.9
88	Diseases of the organs of vision	64	91	99	.1	.1	.1
89	Diseases of the ear and mastoid process	4,112	4,100	3,968	3.2	3.2	3.3
	Diseases of ear	2,022	2,543	2,363	1.6	2.0	2.0
	Diseases of mastoid process	2,090	1,557	1,605	1.6	1.2	1.4
	VII. DISEASES OF THE CIRCULATORY SYSTEM	340,786	333,296	281,287	267.2	263.2	237.4
90	Pericarditis	740	709	1,040	.6	.6	.9
91	Acute endocarditis	3,519	3,574	3,913	2.8	2.8	3.3
	Specified as acute	2,956	2,982	3,158	2.3	2.4	2.7
	Unspecified (under 45 years)	563	592	755	.4	.5	.6
92	Chronic endocarditis, valvular diseases	54,306	57,762	66,482	42.6	45.6	56.1
	Endocarditis, specified as chronic, and other valvular diseases	50,480	54,048	62,213	39.6	42.7	52.5
	Endocarditis, unspecified (45 years and over)	3,826	3,714	4,269	3.0	2.9	3.6
93	Diseases of the myocardium	138,043	136,726	115,864	108.3	108.0	97.8
	Acute myocarditis	4,808	4,800	4,405	3.8	3.8	3.7
	Myocarditis, unspecified (under 45 years)	1,095	1,221	1,793	.9	1.0	1.5
	Chronic myocarditis, myocardial degeneration	101,998	99,679	81,922	80.0	78.7	69.1
	Unspecified	30,142	31,026	27,744	23.6	24.5	23.4
94	Diseases of coronary arteries, angina pectoris	59,744	54,089	28,597	46.9	42.7	24.1
	Angina pectoris	19,182	19,922	19,159	15.0	15.7	16.2
	Diseases of coronary arteries	40,562	34,167	9,438	31.8	27.0	8.0
95	Other diseases of the heart	55,981	50,864	37,188	43.9	40.2	31.4
	Functional diseases of heart	789	878	747	.6	.7	.6
	Other and unspecified	55,192	49,986	36,441	43.3	39.5	30.8
96	Aneurysm (except of heart)	2,440	2,393	2,119	1.9	1.9	1.8
97	Arteriosclerosis (coronary arteries excepted)	21,549	22,698	21,868	16.9	17.9	18.5
98	Gangrene	857	900	1,094	.7	.7	.9
99	Other diseases of the arteries	1,602	1,684	1,459	1.3	1.3	1.2
100	Diseases of veins (varices, hemorrhoids, phlebitis, etc.)	748	715	725	.6	.6	.6
101	Diseases of lymphatic system (lymphangitis, etc.)	177	169	156	.1	.1	.1
102	Idiopathic anomalies of the blood pressure	778	743	518	.6	.6	.4
103	Other diseases of the circulatory system	302	272	264	.2	.2	.2
	VIII. DISEASES OF THE RESPIRATORY SYSTEM	118,557	114,879	113,237	93.0	90.7	95.6
104	Diseases of the nasal fossae and annexa	1,096	1,097	1,088	.9	.9	.9
	Diseases of nasal fossae	391	375	340	.3	.3	.3
	Others under this title	705	722	748	.6	.6	.6
105	Diseases of the larynx	474	522	477	.4	.4	.4
106	Bronchitis	3,966	4,145	4,992	3.1	3.3	4.2
	Acute	1,281	1,422	1,737	1.0	1.1	1.5
	Chronic	1,794	1,794	2,015	1.4	1.4	1.7
	Unspecified (under 5 years)	246	250	436	.2	.2	.4
	Unspecified (5 years and over)	645	679	804	.5	.5	.7
107	Bronchopneumonia (including capillary bronchitis)	42,621	41,923	40,663	33.4	33.1	34.3
	Bronchopneumonia	42,288	41,520	40,131	33.2	32.8	33.9
	Capillary bronchitis	333	403	532	.3	.3	.4
108	Lobar pneumonia	57,658	54,794	53,810	45.2	43.3	45.4
109	Pneumonia, unspecified	4,116	3,856	4,184	3.2	3.0	3.5
110	Pleurisy	2,908	2,897	2,689	2.3	2.3	2.3
111	Congestion, edema, embolism, hemorrhagic infarct, thrombosis of lungs	2,222	2,051	1,935	1.7	1.6	1.6
	Pulmonary embolism and thrombosis	635	511	487	.5	.4	.4
	Others under this title	1,587	1,540	1,448	1.2	1.2	1.2
112	Asthma	1,861	1,983	1,954	1.5	1.6	1.6
113	Pulmonary emphysema	115	119	153	.1	.1	.1

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	VIII. DISEASES OF THE RESPIRATORY SYSTEM—Continued.						
114	Other diseases of the respiratory system (tuberculosis excepted)	1,520	1,492	1,292	1.2	1.2	1.1
	Chronic interstitial pneumonia, including occupational diseases of respiratory system	363	364	271	.3	.3	.2
	Others, including gangrene of lung	1,157	1,128	1,021	.9	.9	.9
	IX. DISEASES OF THE DIGESTIVE SYSTEM	89,659	95,961	101,756	70.3	75.8	85.9
115	Diseases of buccal cavity and annexa and of pharynx, tonsils	5,835	5,970	5,673	4.6	4.7	4.8
	Diseases of pharynx and tonsils	4,922	4,994	4,743	3.9	3.9	4.0
	Others under this title	913	976	930	.7	.8	.8
116	Diseases of esophagus	217	169	155	.2	.1	.1
117	Ulcer of stomach and duodenum	8,430	7,690	7,360	6.6	6.1	6.2
	Ulcer of stomach	5,839	5,328	5,046	4.6	4.2	4.3
	Ulcer of duodenum	2,591	2,362	2,314	2.0	1.9	2.0
118	Other diseases of stomach (cancer excepted)	3,355	3,650	4,528	2.6	2.9	3.8
119	Diarrhea and enteritis (under 2 years)	13,204	17,019	23,294	10.4	13.4	19.7
120	Diarrhea and enteritis (2 years and over)	4,760	6,192	7,898	3.7	4.9	6.7
121	Appendicitis	16,142	18,129	18,100	12.7	14.3	15.3
122	Hernia, intestinal obstruction	13,161	13,023	12,176	10.3	10.3	10.3
	Hernia	5,345	5,093	4,550	4.2	4.0	3.8
	Intestinal obstruction	7,816	7,930	7,626	6.1	6.3	6.4
123	Other diseases of intestines	1,534	1,455	1,263	1.2	1.1	1.1
124	Cirrhosis of liver	10,083	9,733	8,583	7.9	7.7	7.2
	Specified as alcoholic	797	773	568	.6	.6	.5
	Not specified as alcoholic	9,286	8,960	8,015	7.3	7.1	6.8
125	Other diseases of the liver (including yellow atrophy of liver)	1,642	1,800	1,836	1.3	1.4	1.5
	Yellow atrophy of liver	473	511	590	.4	.4	.5
	Others under this title	1,169	1,289	1,246	.9	1.0	1.1
126	Biliary calculi	4,543	4,749	4,595	3.6	3.8	3.9
127	Other diseases of gall bladder, biliary passages	4,034	4,058	3,939	3.2	3.2	3.3
128	Diseases of pancreas	769	746	669	.6	.6	.6
129	Peritonitis, cause not specified	1,950	1,578	1,687	1.5	1.2	1.4
	X. DISEASES OF THE GENITOURINARY SYSTEM	122,707	125,171	123,650	96.2	98.9	104.4
130	Acute nephritis (including unspecified under 10 years)	4,457	4,508	5,178	3.5	3.6	4.4
131	Chronic nephritis	92,272	93,922	92,355	72.4	74.2	78.0
132	Nephritis, unspecified (10 years and over)	6,787	8,154	10,086	5.3	6.4	8.5
133	Other diseases of kidneys and ureters (puerperal diseases excepted)	3,893	3,730	3,506	3.1	2.9	3.0
134	Calculi of urinary passages	1,430	1,372	1,009	1.1	1.1	.9
135	Diseases of bladder (tumor excepted)	764	740	853	.6	.6	.7
136	Diseases of urethra, urinary abscess, etc.	517	468	432	.4	.4	.4
	Stricture of urethra	322	311	297	.3	.2	.3
	Others under this title	195	157	135	.2	.1	.1
137	Disease of prostate	8,477	8,357	6,464	6.6	6.6	5.5
138	Diseases of male genital organs, not specified as venereal	115	135	106	.1	.1	.1
139	Diseases of female genital organs, not specified as venereal	3,995	3,785	3,661	3.1	3.0	3.1
	Cysts of ovary	684	754	776	.5	.6	.7
	Other diseases of ovaries, diseases of tubes and parametrium	2,219	1,993	2,052	1.7	1.6	1.7
	Diseases of uterus	967	943	756	.8	.7	.6
	Nonpuerperal diseases of breast (cancer excepted)	30	16	19	(1)	(1)	(1)
	Others under this title	95	79	58	.1	.1	(1)

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	XI. DISEASES OF PREGNANCY, CHILDBIRTH, AND THE PUERPERAL STATE	12,544	12,859	15,165	9.8	10.2	12.8
140	Abortion with septic conditions	2,167	2,204	2,009	1.7	1.7	1.7
141	Abortion without mention of septic conditions (to include hemorrhages)	602	570	685	.5	.5	.6
142	Ectopic gestation	545	571	606	.4	.5	.5
	Septic conditions specified	105	106	103	.1	.1	.1
	Septic conditions not mentioned	440	465	503	.3	.4	.4
143	Other accidents of pregnancy (not to include hemorrhages)	84	94	171	.1	.1	.1
144	Puerperal hemorrhage	1,370	1,404	1,545	1.1	1.1	1.3
	Placenta praevia	425	432	554	.3	.3	.5
	Other puerperal hemorrhages	945	972	991	.7	.8	.8
145	Puerperal septicemia and ectopic conditions (not specified as due to abortion)	2,902	2,808	3,430	2.3	2.2	2.9
	Puerperal septicemia and pyemia	2,897	2,800	3,411	2.3	2.2	2.9
	Puerperal tetanus	5	8	19	(1)	(1)	(1)
146	Puerperal albuminuria and eclampsia	2,229	2,431	3,655	1.7	1.9	3.1
147	Other toxemias of pregnancy	497	559	502	.4	.4	.4
148	Puerperal phlegmasia, alba dolens, embolus, sudden death (not specified as septic	578	561	710	.5	.4	.6
149	Other accidents of childbirth	1,543	1,621	1,807	1.2	1.3	1.5
	Cesarean operation	336	416	441	.3	.3	.4
	Others under this title	1,207	1,205	1,366	.9	1.0	1.2
150	Other and unspecified conditions of puerperal state	27	36	45	(1)	(1)	(1)
	XII. DISEASES OF THE SKIN AND CELLULAR TISSUES	2,018	2,144	2,121	1.6	1.7	1.8
151	Furuncle, carbuncle	585	605	624	.5	.5	.5
152	Phlegmon, acute abscess	728	766	771	.6	.6	.7
153	Other diseases of skin and annexa, and of cellular tissue	705	773	726	.6	.6	.6
	XIII. DISEASES OF THE BONES AND ORGANS OF LOCOMOTION	1,654	1,694	1,558	1.3	1.3	1.3
154	Osteomyelitis	1,103	1,115	1,052	.9	.9	.9
155	Other diseases of the bones (tuberculosis excepted)	174	189	200	.1	.1	.2
156	Diseases of joints and other organs of locomotion	377	390	306	.3	.3	.3
	Diseases of joints (tuberculosis and rheumatism excepted)	282	277	244	.2	.2	.2
	Diseases of other organs of locomotion	95	113	62	.1	.1	.1
	XIV. CONGENITAL MALFORMATIONS	11,840	12,640	13,280	9.3	10.0	11.2
157	Congenital malformations	11,840	12,640	13,280	9.3	10.0	11.2
	Congenital hydrocephalus	1,667	1,653	1,607	1.3	1.3	1.4
	Spina bifida and meningocele	1,163	1,317	1,462	.9	1.0	1.2
	Congenital malformations of the heart	5,982	6,368	6,978	4.7	5.0	5.9
	Others under this title	3,028	3,302	3,233	2.4	2.6	2.7
	XV. DISEASES OF EARLY INFANCY	51,214	54,348	58,966	40.2	42.9	49.8
158	Congenital debility	3,613	4,223	4,700	2.8	3.3	4.0
159	Premature birth	33,147	35,102	37,433	26.0	27.7	31.6
160	Injury at birth	9,644	9,860	10,839	7.6	7.8	9.1
	Cesarean operation	321	376	240	.3	.3	.2
	Without Cesarean operation	9,323	9,484	10,599	7.3	7.5	8.9
161	Other diseases peculiar to early infancy	4,810	5,163	5,994	3.8	4.1	5.1
	Atelectasis	2,093	2,034	2,106	1.6	1.6	1.8
	Icterus of new-born	851	968	1,008	.7	.8	.9
	Sclerema	7	10	13	(1)	(1)	(1)
	Others under this title	1,859	2,151	2,867	1.5	1.7	2.4
162	XVI. SENILITY	10,010	10,961	11,766	7.8	8.7	9.9

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	XVII. Violent and accidental deaths	128,768	132,022	124,695	101.0	104.3	105.3
163–171	Suicide	18,214	18,828	18,551	14.3	14.9	15.7
163	By solid or liquid poisons or by absorption of corrosive substances	2,852	2,960	3,056	2.2	2.3	2.6
	Arsenic	208	225	239	.2	.2	.2
	Hydrocyanic acid	332	302	131	.3	.2	.1
	Opium, morphine, laudanum	472	32	30	.4	(1)	(1)
	Strychnine	20	337	356	(1)	.3	.3
	Corrosive sublimate	330	354	436	.3	.3	.4
	Carbolic acid	323	562	775	.3	.4	.7
	Lysol	376	366	374	.3	.3	.3
	Other poisons or kind not stated	791	782	715	.6	.6	.6
164	By poisonous gas	2,395	2,374	2,579	1.9	1.9	2.2
165	By hanging or strangulation	3,399	3,517	3,281	2.7	2.8	2.8
166	By drowning	903	872	963	.7	.7	.8
167	By firearms	6,830	7,296	6,833	5.4	5.8	5.8
168	By cutting or piercing instruments	777	847	877	.6	.7	.7
169	By jumping from high places	698	633	604	.5	.5	.5
170	By crushing	163	147	167	.1	.1	.1
171	By other means	197	182	191	.2	.1	.2
172–175	Homicide	10,587	12,055	10,617	8.3	9.5	9.0
172	(Infanticide—murder of infants under 1 year)	*124*	*127*	*134*	*.1*	*.1*	*.1*
173	By firearms	6,506	7,702	7,190	5.1	6.1	6.1
174	By cutting or piercing instruments	2,018	2,122	1,615	1.6	1.7	1.4
175	By other means	2,063	2,231	1,812	1.6	1.8	1.5
176–198	Accidental, other, or undefined	99,967	101,139	95,527	78.4	79.9	80.6
176	Attack by venomous animals	211	147	104	.2	.1	.1
177	Poisoning by food	709	738	805	.6	.6	.7
178	Accidental absorption of poisonous gas	1,665	1,695	2,433	1.3	1.3	2.1
	Not associated with symbols 201–214	1,608	1,639	2,315	1.3	1.3	2.0
	Associated with symbols 201–214	57	56	118	(1)	(1)	.1
179	Other acute accidental poisonings (except gas)	1,411	1,417	1,770	1.1	1.1	1.5
	Wood alcohol	89	68	316	.1	.1	.3
	Denatured alcohol	149	74	137	.1	.1	.1
	Carbolic acid	42	44	60	(1)	(1)	.1
	Opium, morphine, laudanum	23	26	24	(1)	(1)	(1)
	Strychnine	82	113	148	.1	.1	.1
	Other poisons or kind not stated	1,026	1,092	1,085	.8	.9	.9
180	Conflagration	1,581	1,752	1,992	1.2	1.4	1.7
181	Accidental burns (except conflagration)	6,293	6,509	6,523	4.9	5.1	5.5
	Not associated with symbols 201–214	5,687	5,758	5,898	4.5	4.5	5.0
	Associated with symbols 201–214	606	751	625	.5	.6	.5
182	Accidental mechanical suffocation	1,230	1,124	1,152	1.0	.9	1.0
	Not associated with symbols 201–214	1,132	1,055	1,091	.9	.8	.9
	Associated with symbols 201–214	98	69	61	.1	.1	.1
183	Accidental drowning	7,108	7,326	7,450	5.6	5.8	6.3
	Not associated with symbols 201–214	5,855	6,006	6,641	4.6	4.7	5.6
	Associated with symbols 201–214	1,253	1,320	809	1.0	1.0	.7
184	Traumatism by firearms	2,854	3,023	3,120	2.2	2.4	2.6
185	Traumatism by cutting or piercing instruments	1,316	1,254	1,077	1.0	1.0	1.0
	Not associated with symbols 201–214	898	925	755	.7	.7	.6
	Associated with symbols 201–214	418	329	322	.3	.3	.3
186	Traumatism by fall, crushing, landslide	33,762	32,854	26,571	26.5	25.9	22.4
186a	By fall	24,520	23,828	20,030	19.2	18.8	16.9
	Not associated with symbols 201–214	21,400	20,762	17,390	16.8	16.4	14.7
	Associated with symbols 201–214	3,120	3,066	2,640	2.4	2.4	2.2

See footnotes at end of table.

Deaths (exclusive of stillbirths) from each cause and death rates in the United States, 1930, 1934, and 1935—Continued

International list No.	Cause of death	Number			Rate per 100,000 estimated population		
		1935	1934	1930	1935	1934	1930
	XVII. VIOLENT AND ACCIDENTAL DEATHS—Continued						
186b	By crushing, landslide	9,242	9,026	6,541	7.2	7.1	5.5
	Not associated with symbols 201–214	620	613	712	.5	.5	.6
	Associated with symbols 201–214	8,622	8,413	5,829	6.8	6.6	4.9
187	Cataclysm	617	117	117	.5	.1	.1
188	Injuries by animals	520	660	598	.4	.5	.5
189	Hunger and thirst	53	21	28	(1)	(1)	(1)
190	Excessive cold	397	437	337	.3	.3	.3
191	Excessive heat	728	3,250	1,487	.6	2.6	1.3
192	Lightning	362	442	359	.3	.3	.3
193	Accidents due to electric currents	676	723	987	.5	.6	.8
	Not associated with symbols 201–214	566	623	879	.4	.5	.7
	Associated with symbols 201–214	110	100	108	.1	.1	.1
194	Other accidents	38,120	37,483	38,461	29.9	29.6	32.5
194a	Foreign bodies	736	681	667	.6	.5	.6
	Not associated with symbols 201–214	736	681	667	.6	.5	.6
194b	Others under this title	37,384	36,802	37,794	29.3	29.1	31.9
	Not associated with symbols 201–214	5,012	4,558	4,891	3.9	3.6	4.1
	Associated with symbols 201–214	32,372	32,244	32,903	25.4	25.5	27.8
195	Violent deaths of unknown nature	160	5	8	.1	(1)	(1)
196	Wounds of war	3		6	(1)		(1)
198	Legal executions	191	162	142	.1	.1	.1
	XVIII. ILL-DEFINED CAUSES OF DEATH	20,552	20,929	24,864	16.1	16.5	21.0
199	Sudden death	1,908	2,004	2,400	1.5	1.6	2.0
200	Cause of death not specified or ill-defined	18,644	18,925	22,464	14.6	14.9	19.0
	Ill-defined	5,263	5,128	5,600	4.1	4.0	4.7
	Not specified or unknown	13,381	13,797	16,864	10.5	10.9	14.2
	Supplemental classification [2]						
201	Accidents in mines and quarries	1,581	1,480	2,560	1.2	1.2	2.2
202	Accidents from agricultural machinery	367	226	314	.3	.2	.3
203	Elevator accidents	222	231	3[illegible]8	.2	.2	.3
204	Accidents from machinery used for recreation	22	14	17	(1)	(1)	(1)
205	Other machinery accidents	1,186	1,139	1,386	.9	.9	1.2
206	Railroad and automobile collisions	1,587	1,457	1,760	1.2	1.2	1.5
207	Other railroad accidents	3,819	3,789	4,012	3.0	3.0	3.4
208	Street car and automobile collisions	253	332	463	.2	.3	.4
209	Other street car accidents	512	552	711	.4	.4	.6
210	Automobile accidents (primary)	34,183	33,980	29,080	26.8	26.8	24.5
211	Motorcycle accidents	346	332	375	.3	.3	.3
212	Other land transportation accidents	1,179	1,202	1,076	.9	.9	.9
213	Water transportation accidents	1,041	1,186	717	.8	.9	.6
214	Air transportation accidents	358	428	596	.3	.3	.5

* Data for 1930 do not include Texas.

[1] Less than 1/10 of 1 per 100,000 estimated population.

[2] Deaths tabulated under International list numbers 178, 181, 182, 183, 185, 186a, 186b, 193, 194a, 194b, as "Associated with symbols 201–214," are retabulated in the supplemental classification. The detailed classification under numbers 201–214 is omitted here.

DEATHS DURING WEEK ENDED APRIL 10, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 10, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9,466	9,206
Average for 3 prior years	8,995	
Total deaths, first 14 weeks of year	142,237	136,899
Deaths under 1 year of age	601	586
Average for 3 prior years	620	
Deaths under 1 year of age, first 14 weeks of year	8,777	8,261
Data from industrial insurance companies:		
Policies in force	69,637,691	68,350,305
Number of death claims	14,956	12,900
Death claims per 1,000 policies in force, annual rate	11.2	9.9
Death claims per 1,000 policies, first 14 weeks of year, annual rate	11.5	11.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 17, 1937, and Apr. 18, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936
New England States:								
Maine		2	10	13	9	117	0	0
New Hampshire				1	73	15	0	0
Vermont	3	3			1	593	0	0
Massachusetts	2	6			714	1,216	9	4
Rhode Island	2	1			211	78	1	1
Connecticut	1	2	9	6	517	104	0	0
Middle Atlantic States:								
New York	45	43	[1] 23	[1] 13	1,073	2,653	16	21
New Jersey	14	11	5	53	2,582	311	5	6
Pennsylvania	33	48			737	1,509	15	12
East North Central States:								
Ohio	21	21	147	173	900	360	14	52
Indiana	9	10	24	83	203	24	5	8
Illinois	30	35	33	54	209	31	8	19
Michigan	11	9	7	14	84	68	4	4
Wisconsin	3	1	60	71	24	94	1	2
West North Central States:								
Minnesota	8			1	20	520	1	2
Iowa	10	4	2	8	9	8	0	4
Missouri	20	25	103	532	31	19	1	6
North Dakota		8	22	7		2	1	0
South Dakota	1					15	1	1
Nebraska	1	6			70	93	0	0
Kansas	3	8	6	43	42	22	0	4
South Atlantic States:								
Delaware	2				60	6	0	0
Maryland [2]	7	2	15	12	737	255	4	22
District of Columbia	4	13		1	94	96	3	5
Virginia	10	30		334	668	104	19	8
West Virginia	17	8	51	124	53	99	9	14
North Carolina [3]	19	12	77	18	248	57	3	6
South Carolina [3]	2	1	429	299	41	35	0	8
Georgia [3]	9	4	247	180			4	1
Florida	9	5		51		13	18	8
East South Central States:								
Kentucky	5	7	34	262	315	54	13	33
Tennessee	6	5	154	427	18	63	2	8
Alabama [3]	11	9	365	421	11	60	15	2
Mississippi [2]	5	2					1	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 17, 1937, and Apr. 18, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936
West South Central States:								
Arkansas	1	6	82	1,040		6	1	0
Louisiana	13	13	26	258	7	41	2	5
Oklahoma [4]	8	10	133	538	61	16	3	7
Texas [3]	42	34	763	592	1,011	418	6	7
Mountain States:								
Montana	2	2	7	33		6	1	1
Idaho	3		38	7	24	19	2	2
Wyoming					2	7	0	0
Colorado	10	5			7	19	1	0
New Mexico	1	3	1	8	80	49	1	3
Arizona	1	6	30	119	186	144	1	0
Utah [2]					23	31	0	1
Pacific States:								
Washington			1	6	54	451	1	3
Oregon [5]		1	39	106	7	305	0	2
California	15	24	258	564	214	2,692	1	6
Total	419	445	3,201	6,472	11,430	12,898	193	300
First 15 weeks of year	7,637	8,617	262,793	120,474	104,153	138,385	2,540	3,679

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936
New England States:								
Maine	1	0	25	22	0	0	1	0
New Hampshire	0	0	14	4	0	0	0	0
Vermont	0	0	9	11	1	0	0	0
Massachusetts	0	0	308	253	0	0	1	0
Rhode Island	0	0	56	24	0	0	0	0
Connecticut	0	0	177	63	0	0	0	2
Middle Atlantic States:								
New York	3	1	1,034	965	1	0	8	7
New Jersey	0	0	214	427	0	0	2	0
Pennsylvania	1	1	1,077	746	0	0	8	2
East North Central States:								
Ohio	1	1	419	473	2	2	7	22
Indiana	0	0	218	294	14	7	1	1
Illinois	1	0	835	705	60	4	4	4
Michigan	2	2	720	320	13	1	6	1
Wisconsin	0	0	289	490	12	9	4	3
West North Central States:								
Minnesota	2	0	163	377	13	10	0	1
Iowa	0	0	287	220	48	26	3	1
Missouri	0	0	478	231	47	9	3	1
North Dakota	0	0	16	41	13	15	0	0
South Dakota	0	0	63	62	2	22	1	0
Nebraska	0	0	62	137	8	11	1	0
Kansas	1	0	401	386	37	24	0	0
South Atlantic States:								
Delaware	0	0	11	5	0	0	1	0
Maryland [2]	0	0	50	71	0	0	0	0
District of Columbia	1	0	21	16	0	0	2	0
Virginia	0	0	19	42	0	2	2	3
West Virginia	3	0	56	47	0	0	4	6
North Carolina [3]	0	1	28	10	0	0	3	1
South Carolina [3]	1	0	3	3	0	1	4	3
Georgia [3]	0	1	6	24	0	0	3	6
Florida	0	0	15	8	0	0	5	6

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 17, 1937 and Apr. 18, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936	Week ended Apr. 17, 1937	Week ended Apr. 18, 1936
East South Central States:								
Kentucky	1	0	57	79	2	1	4	6
Tennessee	1	0	25	24	0	0	6	1
Alabama [3]	1	0	7	7	0	0	2	1
Mississippi [2]	2	0	7	8	0	1	5	0
West South Central States:								
Arkansas	0	0	8	12	0	0	0	1
Lousiana	0	0	12	8	0	0	13	2
Oklahoma [4]	0	0	33	53	7	0	1	2
Texas [3]	3	0	208	59	11	0	15	6
Mountain States:								
Montana	0	0	39	76	9	15	1	1
Idaho	0	0	21	33	7	1	1	0
Wyoming	0	0	14	54	4	8	0	0
Colorado	0	0	33	94	15	2	0	0
New Mexico	0	0	29	88	0	0	1	0
Arizona	0	0	16	16	0	0	0	1
Utah	0	0	18	64	0	2	0	1
Pacific States:								
Washington	0	0	15	80	6	3	2	1
Oregon [5]	1	0	35	56	15	22	1	1
California	4	4	213	263	18	6	4	12
Total	30	11	7,859	7,546	365	204	130	106
First 15 weeks of year	336	249	103,233	118,216	4,698	3,323	1,644	1,580

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 17, 1937, 24 cases, as follows: North Carolina, 1; South Carolina, 2. Georgia, 10; Alabama, 2; Texas, 9.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 17, 1937, Oregon, 1 case.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1937										
Colorado	5	26	4		26		1	298	25	2
Hawaii Territory		13	49		2,806		3	3	0	10
Maryland	28	40	833	1	3,839	1	1	177	0	7
Minnesota	8	57	12		166		0	767	62	4
Mississippi	12	11	16,489	1,605	1,912	205	4	29	0	5
Nevada			34		114		0	26	0	0
New Jersey	13	61	121		12,279		1	995	0	6
Ohio	51	95	806	2	1,329		6	1,517	7	17
Pennsylvania	48	157			1,735		2	3,663	0	18
Rhode Island	7	4	38		1,867		0	315	0	2

March 1937

	Cases
Anthrax:	
Mississippi	1
New Jersey	1
Pennsylvania	1
Chicken pox:	
Colorado	204
Hawaii Territory	192
Maryland	752
Minnesota	569
Mississippi	722
Nevada	24
New Jersey	2,090
Ohio	2,353
Pennsylvania	5,233
Rhode Island	230
Conjunctivitis:	
Hawaii Territory	1
Dengue:	
Mississippi	1
Diarrhea:	
Maryland	5
Ohio (under 2 years; enteritis included)	5
Dysentery:	
Colorado	3
Hawaii Territory (amoebic)	1
Maryland	5
Minnesota (amoebic)	3
Mississippi (amoebic)	82
Mississippi (bacillary)	268
New Jersey	1
Pennsylvania (bacillary)	2
Encephalitis (epidemic or lethargic):	
Maryland	1
New Jersey	2
Ohio	6
Pennsylvania	6
German measles:	
Maryland	65
New Jersey	215
Ohio	44
Pennsylvania	242
Rhode Island	55

March 1937—Continued

Hookworm disease:	
Hawaii Territory	9
Mississippi	276
Impetigo contagiosa:	
Colorado	12
Hawaii Territory	81
Maryland	15
Jaundice, infectious:	
Hawaii Territory	7
Lead poisoning:	
New Jersey	3
Ohio	21
Leprosy:	
Hawaii Territory	6
Mumps:	
Colorado	111
Hawaii Territory	127
Maryland	1,071
Mississippi	1,350
New Jersey	1,646
Ohio	583
Pennsylvania	3,181
Rhode Island	48
Ophthalmia neonatorum:	
Maryland	1
Minnesota	1
Mississippi	5
New Jersey	7
Ohio	82
Paratyphoid fever:	
Hawaii Territory	5
Maryland	5
Puerperal septicemia:	
Mississippi	6
Ohio	2
Rabies in animals:	
Mississippi	35
New Jersey	10
Rabies in man:	
Ohio	1
Rocky Mountain spotted fever:	
Colorado	1
Scabies:	
Maryland	1
Septic sore throat:	
Colorado	2
Maryland	34

March 1937—Continued

Septic sore throat—Contd.	
Minnesota	7
Ohio	116
Rhode Island	9
Tetanus:	
Hawaii Territory	2
Maryland	1
New Jersey	1
Trachoma:	
Colorado	1
Hawaii Territory	1
Minnesota	1
New Jersey	1
Ohio	3
Trichinosis:	
Minnesota	2
New Jersey	3
Ohio	1
Pennsylvania	3
Tularaemia:	
Minnesota	1
Typhus fever:	
Colorado	2
Hawaii Territory	6
Undulant fever:	
Maryland	2
Minnesota	4
Mississippi	3
Nevada	1
New Jersey	9
Ohio	2
Pennsylvania	11
Rhode Island	4
Vincent's infection:	
Maryland	54
Whooping cough:	
Colorado	400
Hawaii Territory	1
Maryland	417
Minnesota	592
Mississippi	471
Nevada	6
New Jersey	500
Ohio	1,941
Pennsylvania	2,457
Rhode Island	158

CASES OF VENEREAL DISEASES REPORTED FOR FEBRUARY 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,036	3.66	327	1.15
Arizona	46	1.19	112	2.90
Arkansas [1]	276	1.38	162	.81
California	1,428	2.53	1,351	2.40
Colorado [2]				
Connecticut	174	1.01	105	.61
Delaware	152	5.94	40	1.63
Dist. of Columbia	164	2.76	130	2.19
Florida [1]	42	.26	25	.15
Georgia	1,286	3.84	432	1.29
Idaho	39	.81	26	.54
Illinois	1,576	2.02	1,121	1.43
Indiana	112	.33	94	.27
Iowa	214	.84	188	.74

See footnotes at end of table.

Reports from States—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Kansas	137	0.74	49	0.27
Kentucky	156	.55	165	.58
Louisiana	182	.86	59	.28
Maine	35	.41	32	.38
Maryland	888	5.32	213	1.28
Massachusetts	509	1.16	429	.98
Michigan	728	1.56	445	.95
Minnesota	255	.97	225	.86
Mississippi	1,932	9.85	2,259	11.52
Missouri	346	.88	246	.63
Montana	31	.58	38	.72
Nebraska	56	.41	38	.28
Nevada [3]				
New Hampshire	12	.24	20	.40
New Jersey	536	1.25	200	.47
New Mexico	50	1.24	21	.52
New York	7,111	5.52	1,656	1.28
North Carolina	1,875	5.49	506	1.48
North Dakota	16	.23	42	.60
Ohio	1,028	1.53	290	.43
Oklahoma	251	1.00	171	.68
Oregon	31	.31	77	.76
Pennsylvania [4]	641	.64	145	.14
Rhode Island	108	1.59	61	.90
South Carolina	381	1.89	401	1.99
South Dakota	74	1.10	24	.36
Tennessee	614	2.11	297	1.02
Texas	265	.44	222	.37
Utah [3]				
Vermont	27	.72	20	.53
Virginia	554	2.10	233	.88
Washington	242	1.48	325	1.99
West Virginia	185	1.02	110	.61
Wisconsin [5]	26	.09	172	.59
Wyoming [3]				
Total	25,827	2.06	13,304	1.06

Reports from cities of 200,000 population or over

Akron, Ohio	56	2.06	14	0.52
Atlanta, Ga	131	4.56	89	3.10
Baltimore, Md	502	6.08	143	1.73
Birmingham, Ala	125	4.43	62	2.20
Boston, Mass	250	3.16	148	1.87
Buffalo, N. Y	140	2.37	94	1.59
Chicago, Ill	955	2.68	777	2.18
Cincinnati, Ohio [3]				
Cleveland, Ohio [3]				
Columbus, Ohio	39	1.28	8	.26
Dallas, Tex	194	6.70	114	3.94
Dayton, Ohio [3]				
Denver, Colo	56	1.89	28	.94
Detroit, Mich.[3]				
Houston, Tex.[6]	125	3.73	26	.78
Indianapolis, Ind	29	.77	31	.62
Jersey City, N. J.[3]				
Kansas City, Mo	59	1.40	9	.21
Los Angeles, Calif	224	1.56	268	1.87
Louisville, Ky.[2]				
Memphis, Tenn	190	7.12	51	1.91
Milwaukee, Wis.[3]				
Minneapolis, Minn	80	1.64	85	1.75
Newark, N. J	239	5.16	83	1.79
New Orleans, La.[3]				
New York, N. Y	5,896	8.07	1,089	1.49
Oakland, Calif	42	1.39	38	1.25
Omaha, Nebr	16	.73	6	.27
Philadelphia, Pa.[3]				
Pittsburgh, Pa.[3]				
Portland, Oreg.[3]				

See footnotes at end of table.

Reports from cities of 200,000 population or over—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Providence, R. I.	60	2.32	28	1.08
Rochester, N. Y.	53	1.57	30	.89
St. Louis, Mo.	165	1.97	115	1.38
St. Paul, Minn.	28	.99	23	.82
San Antonio, Tex.[2]	------	------	------	------
San Francisco, Calif.	197	2.94	182	2.71
Seattle, Wash.	117	3.08	135	3.56
Syracuse, N. Y.	105	4.82	20	.92
Toledo, Ohio	77	2.53	26	.85
Washington, D. C.[7]	164	2.76	130	2.19

[1] Incomplete.
[2] No report for current month.
[3] Not reporting.
[4] Includes only those cases of syphilis that enter the clinics conducted by State department of health.
[5] Only cases of syphilis in the infectious stage are reported.
[6] Reported by Jefferson Davis Hospital; physicians are not required to report venereal disease.
[7] Reported by social hygiene clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 10, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	225	388	106	7,729	855	2,650	24	426	25	1,524	------
Current week[1]	138	240	98	3,453	866	2,630	51	405	14	1,560	------
Maine:											
Portland	0	------	0	1	2	9	0	0	2	1	28
New Hampshire:											
Concord	0	------	0	0	3	0	0	0	0	0	11
Manchester	0	------	0	0	0	0	0	0	0	0	5
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	3	2
Burlington	0	------	0	0	0	0	0	0	0	0	17
Rutland	0	------	1	1	1	1	0	1	0	4	12
Massachusetts:											
Boston	0	------	0	17	45	72	0	11	0	73	272
Fall River	0	------	2	34	2	1	0	0	0	5	18
Springfield	0	------	0	3	1	9	0	1	0	12	39
Worcester	1	------	0	129	5	5	0	2	0	38	------
Rhode Island:											
Pawtucket	0	------	0	8	0	2	0	0	0	0	31
Providence	0	------	0	200	9	52	0	3	1	58	66
Connecticut:											
Bridgeport	0	------	0	11	5	72	0	0	0	0	32
Hartford	1	1	0	2	1	6	0	3	0	6	42
New Haven	0	------	0	0	1	11	0	2	0	2	37
New York:											
Buffalo	0	------	1	98	10	25	0	8	0	24	152
New York	25	26	7	484	207	428	0	82	3	67	1,727
Rochester	0	------	0	2	2	8	0	1	0	23	74
Syracuse	0	------	0	5	6	43	0	0	0	43	64
New Jersey:											
Camden	3	3	3	7	2	6	0	5	0	2	42
Newark	------	------	------	------	------	------	------	------	------	------	------
Trenton	1	1	0	2	4	6	0	2	0	2	45

[1] Figures for Newark, N. J., and Springfield, Ill., estimated; reports not received.

City reports for week ended Apr. 10, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Pennsylvania:											
Philadelphia	6	9	5	24	41	305	0	22	0	76	584
Pittsburgh	8	7	5	93	34	54	0	11	0	19	207
Reading	0	------	3	176	3	12	0	1	0	8	29
Scranton	0	------	------	0	------	19	0	------	0	0	------
Ohio:											
Cincinnati	3	3	2	118	20	24	0	14	0	8	163
Cleveland	2	15	4	73	29	77	0	14	0	72	208
Columbus	0	1	1	8	4	11	0	4	0	32	89
Toledo	1	4	2	113	8	8	0	6	0	41	79
Indiana:											
Anderson	0	------	1	0	2	8	0	0	0	4	10
Fort Wayne	0	------	2	0	5	0	0	1	0	0	36
Indianapolis	1	------	3	115	12	51	0	9	0	39	100
Muncie	0	------	0	0	4	4	0	0	0	0	12
South Bend	0	------	0	3	0	3	0	0	0	1	22
Terre Haute	1	------	0	0	0	0	0	0	0	0	15
Illinois:											
Alton	0	------	0	0	1	9	0	0	0	1	6
Chicago	11	17	4	42	56	323	1	38	0	67	732
Elgin	7	------	0	0	4	2	0	0	0	1	8
Moline	0	------	0	0	2	1	1	0	0	9	18
Springfield	------	------	------	------	------	------	------	------	------	------	------
Michigan:											
Detroit	2	7	0	5	43	355	1	16	0	89	335
Flint	2	------	0	0	7	9	0	0	0	0	33
Grand Rapids	0	------	0	22	2	10	0	1	0	23	25
Wisconsin:											
Kenosha	0	------	0	0	0	2	0	0	0	2	11
Madison	0	------	0	0	0	12	0	0	0	8	24
Milwaukee	1	------	0	4	0	69	0	3	0	21	109
Racine	0	------	0	1	0	5	0	1	0	0	16
Superior	0	------	0	0	0	5	0	0	0	16	8
Minnesota:											
Duluth	0	------	0	1	4	8	0	1	0	8	27
Minneapolis	1	------	2	4	3	38	0	4	0	52	86
St. Paul	0	1	1	1	7	7	0	2	0	139	85
Iowa:											
Cedar Rapids	1	------	------	1	------	3	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	0	------	42	0	------	0	0	33
Sioux City	0	------	------	0	------	20	0	------	0	1	------
Waterloo	1	------	------	1	------	11	0	------	0	7	------
Missouri:											
Kansas City	1	1	0	0	21	92	0	0	0	24	113
St. Joseph	1	------	0	0	3	24	29	1	0	0	31
St. Louis	13	1	1	5	14	118	0	7	0	75	205
North Dakota:											
Fargo	0	------	0	0	0	4	3	2	0	0	12
Grand Forks	0	------	------	0	------	0	3	------	0	3	------
Minot	0	------	0	0	------	0	0	------	0	0	6
South Dakota:											
Aberdeen	0	------	------	0	------	10	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	0	0	10	20	0	2	0	22	62
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	------
Topeka	0	------	0	0	2	14	0	0	0	0	17
Wichita	0	------	0	19	3	6	4	1	0	13	25
Delaware:											
Wilmington	2	------	0	2	2	2	0	0	0	2	34
Maryland:											
Baltimore	8	8	2	658	37	21	0	12	0	57	251
Cumberland	0	------	0	0	1	2	0	0	0	0	11
Frederick	0	------	0	12	1	1	0	1	0	0	4
District of Columbia:											
Washington	4	3	3	116	15	11	0	9	1	10	103
Virginia:											
Lynchburg	0	------	0	1	1	0	0	0	0	1	18
Norfolk	0	1	1	2	6	2	0	3	0	2	44
Richmond	0	------	0	1	5	1	0	2	1	0	46
West Virginia:											
Charleston	2	------	0	2	7	4	0	1	1	0	32
Huntington	0	------	------	0	------	------	0	------	0	0	------
Wheeling	0	------	0	2	2	4	0	0	0	3	23

City reports for week ended Apr. 10, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
North Carolina:											
Raleigh	0		0	0	2	0	0	0	0	0	12
Wilmington	0		0	0	5	0	0	0	1	0	11
Winston-Salem	0	1	0	1	1	2	0	0	0	7	14
South Carolina:											
Charleston	1	41	1	0	4	0	0	1	0	0	20
Columbia	0		0	0	3	0	0	0	0	0	11
Greenville	0		0	0	0	1	0	0	0	0	3
Georgia:											
Atlanta	3	19	5	0	0	5	0	5	0	4	95
Brunswick	0		0	0	0	0	0	0	0	2	5
Savannah	0	15	2	0	1	0	0	0	0	0	42
Florida:											
Miami	0	5	2	2	2	1	0	2	1	0	45
Tampa	0	2	1	1	3	2	0	1	0	0	25
Kentucky:											
Ashland	0		1	57	5	0	0	0	0	0	29
Covington	0		0	8	2	1	0	1	0	0	12
Lexington	0		0	10	2	0	0	2	0	15	25
Louisville	0	4	3	4	17	17	0	5	0	25	88
Tennessee:											
Knoxville	0		1	0	3	1	0	1	0	0	27
Memphis	1		5	1	10	4	0	6	1	35	84
Nashville	0		4	0	8	4	0	3	0	12	54
Alabama:											
Birmingham	2	13	3	2	8	4	0	6	0	2	104
Mobile	1		2	0	5	3	0	2	0	2	25
Montgomery	0	3		0		0	0		0	4	
Arkansas:											
Fort Smith	0			0		0	0		0	0	
Little Rock	0		1	0	1	3	0	2	1	0	4
Louisiana:											
Lake Charles	0			0	2	0	0		2	0	8
New Orleans	4	9	6	1	17	8	0	13	0	9	168
Shreveport	0		1	0	4	0	0	2	0	2	29
Oklahoma:											
Muskogee	0			0		0	0		0	0	
Oklahoma City	0	10	0	0	15	0	0	2	0	6	52
Tulsa	0			2	0	6	0		1	0	
Texas:											
Dallas	3	4	4	68	10	13	0	1	0	29	71
Fort Worth	0		0	39	7	8	0	2	0	5	35
Galveston	0		0	0	4	0	0	0	0	0	17
Houston	6		2	0	9	9	9	2	0	0	89
San Antonio	0		2	15	7	1	0	11	1	3	77
Montana:											
Billings	0		0	1	0	0	1	0	0	0	5
Great Falls	0		0	0	1	2	0	0	0	1	10
Helena	0		0	11	0	2	0	0	0	0	2
Missoula	0		0	0	0	0	0	0	1	0	2
Idaho:											
Boise	0		0	0	1	0	0	0	0	0	10
Colorado:											
Colorado Springs	1		0	0	2	7	0	2	0	6	17
Denver	4		2	4	3	16	0	2	0	21	88
Pueblo	0		0	0	1	2	0	0	0	1	7
New Mexico:											
Albuquerque	0		0	0	0	0	0	6	0	0	16
Utah:											
Salt Lake City	2		0	23	0	11	0	3	0	9	36
Washington:											
Seattle	2		1	7	5	6	1	3	0	20	122
Spokane	0	2	2	2	3	1	1	1	0	9	36
Tacoma	0		0	0	1	4	0	0	0	0	41
Oregon:											
Portland	0	5	1	1	6	13	5	1	0	2	88
Salem	0	1		0		1	0		0	1	
California:											
Los Angeles	10	23	1	23	20	25	9	24	0	103	358
Sacramento	2		0	4	2	7	0	2	0	1	27
San Francisco	1	3	1	1	12	17	0	11	0	26	186

City reports for week ended Apr. 10, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Virginia:			
Boston	5	4	0	Richmond	2	1	0
Rhode Island:				North Carolina:			
Providence	1	2	0	Wilmington	2	0	0
New York:				South Carolina:			
New York	5	4	2	Greenville	0	1	0
Syracuse	3	1	0	Georgia:			
Pennsylvania:				Atlanta	1	1	0
Philadelphia	4	1	0	Tennessee:			
Pittsburgh	2	1	0	Knoxville	3	0	0
Reading	0	0	1	Memphis	0	1	0
Ohio:				Alabama:			
Cincinnati	2	1	0	Birmingham	3	2	0
Cleveland	1	2	0	Mobile	2	0	0
Indiana:				Louisiana:			
Indianapolis	0	1	0	Shreveport	0	2	0
Muncie	1	1	0	Oklahoma:			
Illinois:				Oklahoma City	1	0	0
Chicago	0	1	0	Tulsa	0	0	1
Michigan:				Texas:			
Detroit	2	2	0	San Antonio	0	0	1
Missouri:				Montana:			
Kansas City	1	0	0	Missoula	1	0	0
Nebraska:				Utah:			
Omaha	1	0	0	Salt Lake City	0	0	1
Maryland:				California:			
Baltimore	5	2	0	Los Angeles	1	2	1
District of Columbia:				Sacramento	1	0	0
Washington	2	1	0	San Francisco	0	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 4; Cleveland, 1; Chicago, 1; Washington, 2; Mobile, 1.

Pellagra.—Cases: Worcester, 1; Charleston, S. C., 3; Savannah, 5; New Orleans, 1; Dallas, 1; Los Angeles, 1.

Typhus fever.—Cases: Charleston, S. C., 2; Galveston, 2.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended April 3, 1937.—During the 4 weeks ended April 3, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	2			13	1	1	17
Chicken pox		4	1	39		5	49
Diphtheria	1	1			2	1	5
Hookworm disease	1			1			2
Leprosy		3		1	2	2	8
Malaria	59	30	14	118	90	219	530
Measles	37	2	10			3	52
Poliomyelitis	1	1					2
Scarlet fever		1					1
Tuberculosis	50	21	41	52	32	27	223
Typhoid fever	10	37	6	54	11	26	144

VIRGIN ISLANDS

Notifiable diseases—January–March 1937.—During the months of January, February, and March, 1937, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	January	February	March	Disease	January	February	March
Chicken pox	1	3		Mumps	1	54	50
Dengue	1	3		Pellagra		3	1
Erysipelas			2	Pneumonia		4	8
Gonorrhea	9	8	7	Schistosomiasis		2	2
Hookworm disease		4	6	Syphilis	8	12	43
Leprosy	1	1		Tetanus			4
Malaria	163	95	164	Tuberculosis	3	3	3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan-American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937					February 1937				March 1937			
						2	9	16	23	30	6	13	20	27	6	13	20	27
Afghanistan	C		P															
Ceylon: Batticaloa	C		3															
India	C	19,883	20,423	23,017	17,965	4,921	4,585	3,817	3,742	3,117	2,839	1,778	1,473	1,646				
	D	9,785	9,520	11,747	9,506	2,733	2,660	2,118	2,115	1,656	1,559	1,026	821	809				
Assam	C	289	368	710	664	343	102	57	44	39	82	34	29	52	62	64	101	167
	D	158	184	318	315	191	67	30	19	23	30	19	12	19	24	26	42	60
Bassein	C												4	4	3	9	17	8
Bombay Presidency	C	2,970	4,281	2,359	2,637	283	83	76				53	77	61	28		19	
	D	1,378	1,575	1,120	1,467	151	54	43				26	45	39	14		7	
Bombay	C	[1]1	[2]1		2													
Calcutta	C	54	73	61	61	17	11	18	23	19	26	14	26	21	16	21	35	34
Central Provinces and Berar	C	4,363	4,239	922	567	52	69	3		1					2	1	1	
Chittagong	C	6	2	16	11	2				1	1	1						3
Madras Presidency	C	4,607	6,271	10,204	5,588	1,860	2,008	2,230	2,392	2,162	1,986	1,195	643	692				
	D	2,336	3,143	5,161	2,885	935	1,127	1,162	1,350	1,132	1,081	677	371	385				
Madras	C	8	21	57	60	21	21	11	14	8	6	12	4	3		1	2	2
	D	1	6	12	21	8	10	6	9	8	2	9	2	1			1	
Negapatam	C	9			11	4	11	4	1	2	3		1		1			1
	D	5			7	4	7	1		1	1							
Northwest Frontier Province	C			84	7													
Orissa Province	C			155	994	183	208	192	130	176	163	144	168	134	137	137	148	180
Punjab	C	169	18	7													1	
Rangoon	C		4	4	2			1			1			3	2	1		
Sind State	C	38																
Tuticorin	C			12	3													
India (French):																		
Chandernagor Territory	C				5	5	3			1								
Karikal Province	C	25	69	4	96	23	22	15	26	10	5	5	5	1			2	
Pondichery Province	C	4		10							6	7			1			

[1] Suspected.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937 2	9	16	23	30	February 1937 6	13	20	27	March 1937 6	13	20	27
Indochina (see also table below): Cochinchina—																		
Chaudoc	C															P		
Cholon Province	C								1									
Vinlong	C				1													
Siam:																		
Bangkok	C				2	7	8	19	54	62	52	40	37	34	37	39	57	93
Provinces	C	57	18		196	101	119	169	221	245	252	385	305	397	275	265	465	480

Place		October 1936 1–10	11–20	21–31	November 1936 1–10	11–20	21–30	December 1936 1–10	11–20	21–31	January 1937 1–10	11–20	21–31	February 1937 1–10	11–20	21–28	Mar. 1–10, 1937
Indochina (French) (see also table above):																	
Cambodia [3]	C							1									2
	D							1									2
Cochinchina [3]	C	1				1			1				1				2
	D	1				1			1				1				2

[3] Reports incomplete.

PLAGUE [1]

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937, 2	Jan. 9	Jan. 16	Jan. 23	Jan. 30	February 1937, 6	Feb. 13	Feb. 20	Feb. 27	March 1937, 6	Mar. 13	Mar. 20	Mar. 27
Algeria:																		
Algiers	C				[2] 1													
Plague-infected rats			2															
Oran Department	C	[2] 2																
Argentina. (See table below.)																		
Belgian Congo	C		[2] 2															
Brazil. (See table below.)																		
British East Africa:																		
Kenya	C	14	10	18	8		10	7		3		2	5		2	1	1	
Tanganyika	C										34	21	19	10			4	
Uganda	C	87	81	85	52	4	6	9	8	9	6	9	7	10	5	12	7	
	D	78	79	76	50	4	6	7	8	9	6	9	7	10	4	8	6	
Ceylon:																		
Colombo	C	1	3	4	3	1			1	1	3	4	2	1	3	1		2
	D	1	1	3	3	1			1	1	3	3	2	1	3	1		2
Plague-infected rats		1	7	1	4				3	9		6	9	2	2		1	
China:																		
Fukien Province.[3]																		
Hainan Island	C																	P
Dutch East Indies: Java and Madura	C	382	391	317	452	120	117	112										
	D	374	391	315	452	120	115	111										
Ecuador (see also table below):																		
Alausi	C	1																
Babahoyo	C			5	2	1	2					1						
Plague-infected rats				6														
Bajada del Morro	C		3	4														
Guayaquil	C	2	5	21	13	2	5		3	7	9	5	2	10	7	5	9	12
	D	3	1	14	13	1	4		2	4	5	5	3	3	6	4	6	8
Plague-infected rats		6	4	7	8				4	6	7	9	3	14	5	7	5	16
Playas	C				11	1												

[1] Including plague in the United States and its possessions.
[2] Suspected.
[3] For the week ended Apr. 3, 1937, 130 deaths from plague were reported in Fukien Province, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937 2	9	16	23	30	February 1937 6	13	20	27	March 1937 6	13	20	27
Egypt:																		
Alexandria: Plague-infected rats		P	P	P														
Asyut Province	C	4	[4]3	1	2	1	1					1						2
Beheira Province	C		1															
Dakahliya Province.[5]																		
Girga Province	C		1	1											1			
Formosa: Taihoku District	C				1													
France: Marseille [6]	C	2																
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District:																		
Hamakua Mill Sector			2														1	
Kukaiau						1												
Paauhau Sector [7]		22	12	3	5	2	1			6	2	2	2		1	2	2	
Pohakea																	1	
Maui Island—Wailuku District—Keahua Region			1															
India	C	1,172	2,292	2,335	3,029	1,207	1,611	754	773	773	975	1,245	1,314	1,397				
	D	430	684	717	1,099	396	481	389	365	375	450	671	752	655				
Bassein	C			1	1		1	1	1		1		4	2	2	1	2	
Plague-infected rats		1	1											1	1			1
Bombay Presidency	C	72	109	57	105	27	43	29				27			31		19	
	D	45	66	35	50	20	26	18				11			15		8	
Central Provinces and Berar	C	528	1,445	1,376	1,592	456	817	270	193	286	235	388	351	640	806	458	527	422
Karachi	C										1	4	1	1			1	2
Madras Presidency	C	63	48	29	131	21	25	25	8	18	23	42		29			6	
	D	55	25	15	80	18	5	15	7	10	13	25		19			2	
Punjab	C															1		
Rangoon	C		1			1		2					1		1			
Plague-infected rats		3																
Sind State	C											5		1	1	1	2	
Indochina (see also table below): Bentre	C					1												
Iraq: Baghdad Province	C		1															
Madagascar. (See table below.)																		
Malta	C	8	[2]3	6			2	2		2								
	D						1											

Peru. (See table below.)																		
Senegal: Dakar.[8]																		
Tunisia: Tunis	C		5	1	1													
Plague-infected rats					3	1												
Union of South Africa (see also table below)	C	6	3	3	5	[9] 2						[9] 3		[9] 1				[9] 3
United States:																		
California:																		
Eldorado County—Plague-infected chipmunk			1															
Monterey County.[10]																		
Placer County.[10]																		
San Bernardino County.[10]																		
On vessels:																		
S. S. *Delambre* at Liverpool from Montevideo, Buenos Aires, Rosarió, Santos, and Las Palmas—Plague-infected rats		2																
S. S. *Magister* at Kingston from Maranhao, Para, and Manaos	C																	1

[3] Suspected.
[4] Includes 1 case of pneumonic plague.
[5] For the week ended Apr. 10, 1937, 1 case of plague was reported in Dakahliya Province, Egypt.
[6] A report dated Sept. 3, 1936, states that 2 plague-infected rats were reported in Marseille, France.
[7] Plague-infected rats have also been reported in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, as follows: Week ended Apr. 10, 1 plague-infected rat; week ended Apr. 17, 1 plague-infected rat.
[8] For the week ended Apr. 10, 1937, 1 case of plague was reported in Dakar, Senegal.
[9] For 2 weeks.
[10] Plague-infected fleas have been reported in California as follows: According to information dated Nov. 10, 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley, in San Bernardino County, have been proved positive for plague. A report dated Oct. 13, 1936, states that fleas from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague-infected.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Argentina:							
Buenos Aires—							
Plague-infected rats			4				
Catamarca Province	C		1				
Cordoba Province	C			4	5		
Salta Province	C					2	
San Luis Province	C				1		
Santiago del Estero Province	C	[4] 2					
Tucuman Province	C	[11] 6					
Bolivia: Chuquisaca Department	C					P	5
Brazil:							
Ceara State	C					1	
Parahyba State	C					4	
Ecuador (see also table above):							
Manabi—							
Bahia	C						4
Manta	C						8

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Indochina (see also table above):							
Cambodia	C				1		
Cochinchina	C				1	1	
Madagascar (central region)	C	104	160	186	176	[12] 170	[13] 219
	D	95	154	174	167	161	199
Peru	C	8	16	33	16	23	23
Cajamarca Department	C			9			
Lambayeque Department	C	3	1	3	1	2	4
Libertad Department	C	1	6	19	14	15	12
Lima Department	C	2	9	2	1	4	5
Callao: Plague infected rats		P					
Lima City	C						1
Piura Department	C	2				2	2
Union of South Africa (see also table above)	C	21	11	5	2	2	

[4] Includes 1 case of pneumonic plague.
[11] Pneumonic plague.
[12] Includes 44 cases of pneumonic plague.
[13] Includes 66 cases of pneumonic plague.

SMALLPOX

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937					February 1937				March 1937			
						2	9	16	23	30	6	13	20	27	6	13	20	27
Algeria:																		
Algiers Department	C								2									
Oran Department	C														2			
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia	C	99	99	38	20	2	3	3	3	3	3							
Porto Alegre (alastrim)	D	1	4		1	1												
Recife (alastrim)	C		3	3	15						1				3			
Rio de Janeiro	C						1	1	1									
British East Africa: Tanganyika	C	74	453	207	4	151				231			66	56	6	49		
Canada:																		
Alberta	C			4	[1] 4				2	1		[1] 46						
British Columbia	C									[1] 1								
Saskatchewan	C											[1] 1						
Ceylon: Colombo	C		1											1				
China:																		
Amoy	C							3										
Canton	C				2						1	1	2					
Dairen	C				1			2										
Foochow	C	P		P	P		P		P				P		P		P	
Hangchow	C	1			1	2	2	1			1			2				
Hankow	C				5		2	2	3				1	4	1			
Hong Kong	C	1						2	4	1		2	1	2	2	1	1	3
Macao	C														1		1	
Nanking	C		1	1	3			1		1	2	3		2	1			
Shanghai	C		7	24	98	32	38	57	51	53	40	19	40	28	25	32	25	
Tientsin	C		2	1	4			1		1		7	3	1				
Chosen. (See table below.)																		
Colombia	C	[2] 76	84															
Barranquilla	D	1	1	3	7	1					1	1		1				
Dahomey. (See table below.)																		
Dutch East Indies: Java—Surabaya	C									[2] 1								
Ecuador: Guayaquil	C	1	3	8		6	1		1	2	5	8	8	12	23	24	12	14

[1] For 2 weeks.
[2] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937 2	9	16	23	30	February 1937 6	13	20	27	March 1937 6	13	20	27
Egypt:																		
Alexandria	C			[2] 1														
Qena Province	C																	1
Eritrea (see also table below)	C													3	102			1
Ethiopia	C			13														
Finland. (See table below.)																		
France. (See table below.)																		
Gambia:																		
Bathurst	C															[2] 4		
MacCarthy Island	C															4		
Great Britain: England and Wales—																		
Derby	C															1	1	
Lancaster—Failsworth	C							2										
London and Great Towns (Oldham)	C			1	7													
Ripley	C															1		
Greece Salonika	C		40	34	38	10						5	5	5		6	6	6
Guatemala. (See table below.)																		
India	C	3,413	2,388	3,559	4,605	1,658	2,268	2,118	2,253	2,552	3,418	3,492	3,835	3,016				
	D	886	582	863	1,136	400	584	543	570	643	742	799	908	770				
Assam	C	70	64	36	154	20	47	64	44	37	47	78	60	35	49	51	29	34
Bassein	C					6	12											
Bombay Presidency	C	258	183	116	170	34	57	102				217	242		145		242	
	D	46	41	27	30	15	9	13				24	36		23		37	
Bombay	C	17	11	3	7	4	3	2	10	6	8	17	11	13	13	16	9	25
	D	14	6	3	3	5	1	3	4	4	6	7	7	9	10	14	6	18
Calcutta	C	6	12	8	9	3	4	5	8	9	13	17	25	31	23	21	21	22
	D	8	7	2	7	1	2	3	4	2	7	11		16	21	18	13	16
Central Provinces and Berar	C	70	46	38	115	6	36	21	89	83	53	97	81	68	76	64	124	77
Chittagong	C		3	[2] 2	10	48	46	38	48	57	67	62	28	51	24	11	13	7
Cochin	C	2																
Karachi	C			[2] 1	8	2	10	11	9	8	8	9	14	18	20	11	7	2
Madras Presidency	C	442	470	298	161	71	131	168	157	144	188	228		163			74	
	D	96	96	59	37	11	34	27	27	32	27	26		31			15	
Madras	C	3	1	3	7				1	2	4	6	13	14	8	3	5	8
Moulmein	C	12	3	12	31		12	13	10	13	14	19	16	15	16	8	12	12
Northwest Frontier Province	C	22	14	15	57	20	11	35	24	35	12	27	23	23	11	15	15	14
Orissa Province	C				376	130	146	187	81	137	236	289	275	259	186	257	233	172
Punjab	C	65	77	294	499	117	111	109	101	95	95	168	80	147	249	158	75	

Rangoon	C	1	10	11	2	2	[3]1	1		[3]1	5	8	5	1		2	1	2
Sind State	C	51	21	52	180	9	55	42	60	29	36	73	22	53	38	28	77	
Vizagapatam	C		1								1			2	1			
India (Portuguese)	C		7		2													
Indochina (see also table below):																		
Pnom-Penh	C	7	4	5	1													
Saigon-Cholon	C						2				2							
Tourane	C							3			1			2		2		2
Iran	C	9	2	1	1		1	1	3	6	3	2	3	2				
Teheran	C	4	4	2	1						2					1		
Iraq	C		3	6	30		1					1						
Japan:																		
Kobe	C																	[3]1
Moji	C																1	
Osaka	C	21	16															
Tokyo	C			1														
Yokohama	C											1						
Mexico (see also table below):																		
Chihuahua	C										[4]3							
Durango	D				1	1			1				1		4	2	1	3
Guadalajara	D	1																
Mexico, D. F.	C		1	2	2	1		3		3		3	1					
Monterrey	C								2		4	1	5	1	1			
Torreon	C	3	13	2	3	8	1	1	10	11			2	5				1
Morocco. (See table below.)																		
Nicaragua: Puerto Cabezas	C													2				
Nigeria	C		98	12	[1]11		15	68		[1]217	19							
Lagos	C	1	1								1							
Northern Rhodesia	C			91														
Nyasaland. (See table below.)																		
Palestine. (See table below.)																		
Peru. (See table below.)																		
Poland	C										1							
Portugal (see also table below):																		
Lisbon	C	1						2				1			1		1	
Oporto	C	1								1				1				
Siam: Tak Province	C												26					1
Sierra Leone	C	[1]38	28	16	38	[1]9		[1]8		[1]71		[1]9		[1]3				
Freetown	C				3							1						
Southern Rhodesia	C		P		10													
Sudan (Anglo-Egyptian)	C	105	96	113	116	17	15			5	18	23	12	22	1	1	5	5
Tunisia	C	1					1				2			103				
Uruguay. (See table below.)																		

[1] For 2 weeks.
[3] Imported.
[4] For 7 weeks.

On vessels:
- S. S. *Jaldurga* at Rangoon from Gopalpur — 1 case — Dec. 30, 1936
- S. S. *Egra* at Rangoon from Calcutta — 1 case — Jan. 4, 1937
- S. S. *Tango Maru* at Singapore from Japan — 1 death — Jan. 16, 1937
- S. S. *Juna* at Rangoon from Penang — 1 case — Jan. 27, 1937
- S. S. *Horai Maru* at Moji from Keelung — 2 cases — Jan. 28, 1937

On vessels—Continued.
- S. S. *Tjibadak* at Surabaya from Shanghai — 1 case — Jan. 28, 1937
- S. S. *Colorado Springs* at Manila from Shanghai — 1 case — Feb. 1, 1937
- S. S. *Nikko Maru* at Moji from Tsingtao — 1 case — Feb. 7, 1937
- S. S. *Bhadravati* at Bombay from Vengurla — 1 case — Feb. 18, 1937
- S. S. *Nagasaki Maru* at Nagasaki from Shanghai — 1 case — Mar. 8, 1937

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Angola	C	153	124				
Argentina:							
Corrientes Province	C	3	1		1		
Entre Rios Province	C		154	18			
Los Andes Territory	C		12				
Salta Province	C		31		2		
Santa Fe Province	C	2					
Belgian Congo	C	105	110	117	93	39	
Bolivia	C					28	4
Chosen	C	3	2		2	1	
Dahomey	C				11		
Eritrea (see also table above)	C	2			1		
Finland	C				1	1	1
France	C		1	10			
Guatemala	C	1	1	1	4	5	2
Indochina (see also table above)	C	87	39	159	219	306	382
	D	8	12	33	38	84	70

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Mexico (see also table above):							
Chihuahua State—Chihuahua	C	1					
Colima State	C	1					
Jalisco State—Guadalajara	C	3					
	D	1					
Mexico State	C		1				
Mexico, D. F.	C	1	6				
Mexico City	D	1	1	1	2	5	2
Puebla State—Puebla	C	2				2	
Sonora State	C		1				
Morocco	C	1			2	6	6
Nyasaland	C			5			
Palestine	C					2	8
Peru	C	23	24	13			
Portugal (see also table above)	C	83	82	126	162	113	
	D	4	7	5	8	3	
Uruguay	C	1					

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936: 5	12	19	26	January 1937: 2	9	16	23	30	February 1937: 6	13	20	27	March 1937: 6	13	20
Algeria:																				
Algiers Department	C		3	4	1		[1] 3	13	3	9		[1] 49	10		[1] 68	40	20	5	41	14
Algiers	C		1	4				1				1			[1] 2			1	1	
Constantine Department	C	1	10	36	20		[1] 48	30		19		[1] 94	46		[1] 98	9	32	36	30	66
Bone	C			1								[1] 1	1		[1] 10					3
Constantine	C	1		3			[1] 3													

Philippeville	C						1					[illegible]	[illegible]							[illegible]
Oran Department	C		1						2			[1]4	4			12	52	67		5
Southern Territories	C												5		3	6		2		
Arabia: Aden	C																	[2]1		
Australia: Sydney	C			1																
Basutoland	C	7	1																	
Bolivia. (See table below.)																				
Bulgaria. (See table below.)																				
Ceylon: Colombo	C		1																	
Chile	C	543	577	435	117	103	111	54												
Santiago Province	C	83	[3]152	[1]87	43	44	64	4												
Valparaiso	C	1	6	12	14	3	3	1	2		2	4	2	2	1	3	4	11	11	10
China (see also table below):																				
Dairen	C		2	1		3	1					1								
Hankow	C								1	1										
Shanghai	C	2	2															1		
Swatow	C															1				
Tientsin	C		1										1				1	1		
Tsingtao	C						3									1	1			
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C		2					1	1			4	5	1	5	3		1	2	1
Aswan Province	C	1																1	6	
Asyut Province	C		1											1		1			5	
Beheira Province	C								1	7				24	7	29		2	16	
Cairo	C		4	1												1	3	2	5	3
Dakahliya Province	C													5	4	16		7	8	
Faiyum Province	C						1		1											
Gharbiya Province	C		2				3			5				8	3	9		8	4	
Girga Province	C					2														
Minufiya Province	C								1					5	4	11			6	
Minya Province	C								1					19	1	1				
Port Said	C						1	1	3	2		2	1	1						
Qena Province	C									1										
Sharkiya Province	C								1									1		
Provinces	C	5	12	15		2	4	8	6	13	25	49	21	62	10	69	25	19	50	35
Eritrea: Asmara	C										13		1		1					
Finland. (See table below.)																				
France. (See table below.)																				
Greece (see also table below): Salonika	C	4	5	4	1	1	1	1	1											
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	7	12	7	1		1		2	1	2									1
Hungary	C	1														7				1
Iran	C	11	3	2		3	1						7		14	4	1		1	
Teheran	C	2				1					2					3				
Iraq: Baghdad	C										1									
Irish Free State: Kerry County—																				
Caherciveen [4]	C																4			
Dingle	C	3	2																	
Italy: Catania	C			1																

[1] For 2 weeks. [2] Imported. [3] For 3 weeks. [4] During the week ended Apr. 3, 1937, 4 cases of typhus fever were reported in Caherciveen, Kerry County, Irish Free State.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936: 5	12	19	26	January 1937: 2	9	16	23	30	February 1937: 6	13	20	27	March 1937: 6	13	20
Lithuania. (See table below.)																				
Mexico (see also table below):																				
Mexico, D. F.	C	23	16	7	2	1		1	6	4			2	2	8	8	2			
Saltillo	D		1																	
San Luis Potosi	D			1		1			1	1										
Torreon	C	1	2																	
Morocco (see also table below)	C						1		1	2	1		1	6	6	3	7	5	7	
Palestine:																				
Haifa	C	16	10	7	3	2	3	3		1		1	1		1			1		
Jaffa	C	23	12	7		4	4		1		1							1	1	
Paraguay: Asuncion	D	1																		
Peru. (See table below.)																				
Poland	C	47	63	131	53	40	40	33	49	58	77	87	128	88	88	146	163	101	140	
	D	3		6	5	2	2	4	4	6	2	5	5	6	5	7	8	7	7	
Portugal. (See table below.)																				
Rumania. (See table below.)																				
Sierra Leone: Freetown	C			1									1		1					
Straits Settlements: Singapore	C	3							1											
Sudan (Anglo-Egyptian)	C						8													
Trans-Jordan	C															3		1		
Tunisia:																				
Tunis	C	2	2	3					1	2	2		2	2	3			2		
Provinces	C	19	27	43		48	6		[1] 54	41	73	46		50		94	103	133	119	168
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessel: At Santos	C																			P

[1] For 2 weeks.

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Bolivia	C					24	25
Bulgaria	C				19	19	
China: Manchuria—Harbin	C	4		1	7	8	
Chosen	C	24	24	30	28	88	
Czechoslovakia	C	1			3	15	1
Finland	C	1					
France	C			1	1		
Greece (see also table above)	C	9	11	11	2	7	
Guatemala	C	38	17	33	28	29	19
Lithuania	C	1	2	2	3	13	10
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C	1	2				
Chihuahua State	C	1					
Jalisco State: Guadalajara	C	1					
Mexico State	C	4	18				
	D		1				
Mexico, D. F.	C	21	14				
Mexico City	D	8	7	2	5	6	6

Place		September 1936	October 1936	November 1936	December 1936	January 1937	February 1937
Mexico—Continued.							
Oaxaca State	C	2	2				
Puebla State: Puebla	C	6	2		9		
Queretaro State	C	1	3				
San Luis Potosi State: San Luis Potosi	C	1	1	5	7		
Morocco (see also table above)	C			1	2	11	22
Peru	C	48	80	60	52		
Portugal	C	2					
Rumania	C	25	60	178	380	941	1,018
Turkey	C	27	21	18	21	24	50
Istanbul	C	1	3	4	1	7	3
Union of South Africa:							
Cape Province	C	43	75	74	61	52	
Natal	C		7	19	4	4	
Orange Free State	C	14	43	9	8	5	
Transvaal	C	1	4	11	6	13	
Yugoslavia	C	6		7	49	159	125

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Aug. 30–Sept. 26, 1936	Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Week ended— December 1936				January 1937					February 1937				March 1937		
					5	12	19	26	2	9	16	23	30	6	13	20	27	6	13	20
Brazil:[1]																				
Acre Territory	D													1						
Matto Grosso State[1]	C					1								2	13	4				
	D								2		1			1	2	2	1			
Minas Geraes State[1]	C												1	1	1					
	D												1	1	2	4	6	7	4	3
Parana State	C															2				
Sao Paulo State[1]	C											1	3		1					
	D											1	3		1	2	11	9	1	
Colombia	C						3													
	D	3					1													
Barrancabermeja	C													1						
Intendencia of Meta—																				
Acacias	D			1																
Quenane	C		1																	
Restrepo	D	1	2																	
Villavicencio	D	1	2	1																
Santander Department	D	1																		
Dahomey	C	2		1																
French Equatorial Africa: Libreville	C																			[2] 1
	D														1					
French Guinea—Macenta	C	[2] 2	1																	
Gold Coast:																				
Accra	C											4	1	1	2					
Tamale	C						1													
Teshi	C											1								1
Ivory Coast:																				
Adzope	C															3				
Agboville	C																			1
Nigeria:																				
Aba	C	[2] 1																		
Calabar	C			1																
Ilorin Province	D	[2] 1																		
Maiduguri	D			1																
Uyo	C							1												

Senegal:																				
Bambey	C			1																
M'Bour	C			1																
Thies Circle—																				
Khombole [4]	C		1	1																
Thies	C		[2]1	[2]1																
Tivaouane [4]	C	1																		
Sierra Leone	C	[3]1	1																	
Sudan (French):																				
Katibougou	C		1																	
Koulikoro	C	1	2																	
Segou	C		1																	
On vessel: [5] S. S. *Sea Rambler* in River Tyne from Dakar	C	14																		
	D	7																		

[1] See also report of yellow fever in Brazil on page 536 of PUBLIC HEALTH REPORTS for Apr. 23, 1937.
[2] Suspected.
[3] Includes 1 suspected case.
[4] During the week ended Apr. 10, yellow fever was also reported in Senegal as follows: Khombole, Thies Circle, 1 case; Tivaouane, 1 case.
[5] For a detailed report see p. 336 of PUBLIC HEALTH REPORTS of Mar. 19, 1937.

X

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

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CONTENTS

PUBLIC HEALTH REPORTS

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MORTALITY IN CERTAIN STATES DURING 1936, WITH COMPARATIVE DATA FOR RECENT YEARS[1]

The mortality rates in this report are based on data for 25 States and the District of Columbia for the calendar year 1936. This area includes about 60 percent of the total population of the country.

Because of lack of uniformity in the method of classifying deaths according to cause, and because a certain number of death certificates were not filed in time to be included, these rates are preliminary and may differ in some instances from the final rates for the total country published by the Bureau of the Census. In the past, however, they have provided an accurate index to mortality in the United States as a whole. For the entire country the death rates were 10.9, 10.7, 11.0, and 10.9 in 1932, 1933, 1934, and 1935, respectively, while table 1 shows that the rates for this group of States for the same years were 10.7, 10.5, 10.9, and 10.8. The slight differences between these rates and those for the country as a whole arise mainly from the fact that the Pacific Coast and Southwest States are not well represented in the group furnishing preliminary reports. Somewhat greater differences may be expected when specific causes of death are compared, but the trend should be much the same in the country as in this group of States.

The mortality rates for the immediately preceding years are included for comparative purposes. These comparative rates are from the same sources as the current data. Although the trend in mortality is fairly accurately reflected by these current figures, comparisons of specific causes of death in different States should be based upon the final tabulations published by the Bureau of the Census in order to eliminate varying practices in classifying deaths according to cause and other factors.

Mortality from all causes, which has been unusually low throughout the depression, increased in 1936 about 5 percent over 1935 and was the highest figure recorded in these reports since 1929. The rise occurred in all parts of the country; only Montana, South Dakota, and Iowa reported a lower mortality rate than in 1935. The rate for Connecticut remained unchanged. All the remaining 21 States and the District of Columbia reported increases.

[1] From the Division of Public Health Methods, National Institute of Health, U. S. Public Health Service.

Although the rate during each quarter was above that for corresponding months in the 3 preceding years, the largest increase, 6.8 percent, was in the third quarter, followed by an increase of 5 percent in the first quarter. The unusually severe heat wave in July 1936 undoubtedly accounted for a large proportion of the increase in mortality during the summer months.

NEW MINIMUM DEATH RATES

Six diseases registered new minimum death rates during 1936, namely, typhoid fever, measles, whooping cough, diphtheria, poliomyelitis, and diseases of the puerperal state.

The year under report (1936) was the sixth consecutive year in which the death rate from typhoid fever has decreased. However, in spite of the general decline, 11 of the 26 States reported slight increases over 1935.

It is gratifying to note that three of the important diseases of childhood—measles, whooping cough, and diphtheria—each recorded the lowest mortality rate on record for these States. It is true that the rate from these diseases varies irregularly from year to year, and so the low rates of 1936 may not be maintained. For diphtheria, however, 1936 was the eighth consecutive year in which the rate has declined. The reduction in mortality from these three diseases was fairly general throughout the country; of the 26 States a reduction was reported in 22 States for measles, in 21 States for whooping cough, and in 17 States for diphtheria.

The reduction in maternal mortality continued throughout 1936. This makes 8 consecutive years in which the mortality from diseases incidental to pregnancy and childbirth has continuously declined. In the entire country, maternal mortality, which for several years had fluctuated about a constant level since accurate data became available, declined for the fifth consecutive year in 1935 according to reports of the Bureau of the Census. While part of this decrease may be due to the sharp decline in the birth rate in recent years, it may also reflect a real reduction in the hazards of childbirth.

DISEASES WITH LITTLE OR NO CHANGE

Scarlet fever was the only major disease of childhood which failed to register a new minimum death rate. Although it declined slightly from 1935, the mortality rate was at the usual level in recent years of 2.0 per 100,000; 12 of the 26 States reported an increase in scarlet fever mortality in 1936.

No change in the relative number of deaths from encephalitis was reported in 1936. Although 17 States reported a lower death rate than in 1935, this reduction was counterbalanced by fairly substantial increases in 7 other States.

Perhaps the most disquieting aspect of mortality conditions in 1936 was the practical cessation in the decline in mortality from tuberculosis. In fact, 12 of the 26 States on which these reports are based reported increases of varying magnitude. This is the first year since these reports have been published that the mortality from tuberculosis has failed to decline. Of course it is inevitable that the rapid decline in mortality from this cause must some day cease. The record for 1937 may indicate whether or not the cessation in decline is more than temporary. However, much the same situation prevails in the United States as a whole according to reports of the Bureau of the Census. Compared with an average annual decline in mortality from tuberculosis of 4.2 percent during 1930–34 the decline during 1935 over the previous year was only 2.8 percent.

DISEASES SHOWING INCREASED DEATH RATES

The so-called degenerative diseases—cancer, diabetes, cerebral hemorrhage, and heart conditions—continued their upward trend. Until data are available by age it will not be possible to state the amount of this increase which results from the aging of the population.

The combined mortality from influenza and pneumonia was the highest since 1929 and represented an increase of nearly 10 percent over 1935. The increase was greater and more general for pneumonia than for influenza, 23 States reporting increases in mortality from the former as compared with 12 States reporting increases from the latter.

Although the number of deaths from diseases of the digestive system, including diarrhea and enteritis under 2 years of age, was substantially larger than that reported in 1935, the rates were still well below the average of preceding years. Most of the increase occurred in the last two quarters of the year and may have resulted in part from the prolonged period of high temperatures.

The increase in deaths from epidemic cerebrospinal meningitis which was reported for 1935 continued during the first half of 1936. Although there was a slight decrease in the last 6 months of the year, the average rate was the highest recorded since 1930. Increases were reported in 14 of the 26 States reporting.

While the mortality rate from nephritis was about 1.4 percent above that for 1935, it was still well below the average of preceding years and apparently represents only a minor fluctuation from the downward trend in the recorded mortality from this disease.

CHANGES IN INFANT MORTALITY AND THE BIRTH RATE

After a slight rise in 1934, the birth rate continued to decline during 1936. The rate, 16.2 per 1,000 population, was 1.2 percent below that for 1935 and 5.6 percent below the rate reported in 1932. Ten

States reported higher rates than in 1935, 13 States reported lower rates, while 3 States reported no change.

Although the infant mortality rate increased about 2 percent over the previous low rate recorded in 1935, it was still less than any rate previously recorded. It is encouraging to note that infant mortality has declined about 18 percent since 1929. The time will soon come in this country, if present trends continue, when 95 percent of the new-born infants will survive the first 12 months after birth.

TABLE 1.—*Summary of mortality from certain causes in a group of States, 1932-36* [1]

Diseases (numbers in parentheses are from the International List of Causes of Death, fourth revision, 1929)	1936	1935	1934	1933	1932
	Rate per 1,000 population				
25 States (population [2] July 1, 1936, 78,885,000):					
Deaths, all causes	11.3	10.8	10.9	10.5	10.7
Births, exclusive of stillbirths	16.2	16.4	16.3	16.0	17.1
	Rate per 1,000 live births				
25 States (live births 1936, 1,279,279):					
Infant mortality	54	53	58	56	57
Maternal mortality	5.1	5.3	5.5	5.6	5.9
	Death rate per 100,000 population				
26 States (population July 1, 1936, 80,745,000):					
Typhoid fever (1, 2)	1.8	2.0	2.5	2.6	3.2
Measles (7)	.6	2.9	4.2	1.6	1.6
Scarlet fever (8)	2.0	2.1	2.0	2.0	2.0
Whooping cough (9)	1.9	3.6	5.0	2.9	4.0
Diphtheria (10)	2.0	2.4	2.5	2.8	3.6
Acute poliomyelitis and polioencephalitis (16)	.4	.8	.6	.6	.7
Encephalitis, epidemic or lethargic (17)	.6	.6	.7	.9	.7
Epidemic cerebrospinal meningitis (18)	2.2	2.0	.9	1.0	1.3
Influenza (11)	21.5	19.7	15.8	24.2	27.0
Pneumonia, all forms (107-109)	89.7	81.7	80.4	71.5	78.9
Tuberculosis, all forms (23-32)	51.2	51.2	52.7	54.8	58.0
Cancer (45-53)	112.4	110.0	107.9	103.9	101.2
Diabetes mellitus (59)	25.1	23.4	23.4	22.2	22.3
23 States (population July 1, 1936, 73,694,000):					
Cerebral hemorrhage, apoplexy (82, a, b)	88.4	84.6	79.4	78.3	79.4
24 States (population July 1, 1936, 75,428,000):					
Diseases of the heart (90-95)	276.7	253.0	248.4	228.9	221.9
25 States (population July 1, 1936, 77,288,000):					
Nephritis, all forms (130-132)	81.9	80.7	84.7	82.4	85.5
21 States (population July 1, 1936, 69,327,000):					
Diseases of the digestive system (115-129)	67.5	65.9	70.4	68.6	68.8
25 States (population July 1, 1936, 78,885,000):					
Diarrhea and enteritis under 2 years (119)	9.3	7.8	10.8	9.7	10.1

[1] See tables 3, 4, and 5 for names of States included for each disease. The District of Columbia is counted as a State.

[2] All populations given or used in computing rates are official estimates of the Bureau of the Census as of July 1 of each year.

TABLE 2.—*Mortality from certain causes in each quarter of 1936, 1935, 1934, and 1933 in the 23 [1] States with available data*

[Estimated population July 1, 1936: 73,785,000]

Period	All causes, rates per 1,000 population	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid fever (1, 2)	Measles (7)	Scarlet Fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Acute poliomyelitis and polioencephalitis (16)	Encephalitis, epidemic or lethargic (17)	Epidemic cerebrospinal meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes mellitus (59)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the heart (90–95)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis under 2 years (119)	Nephritis (130–132)
January–December:																					
1936	11.3	53	5.0	1.0	0.6	2.1	1.9	1.8	20.2	0.4	0.6	2.3	50.8	116.4	26.1	88.0	276.7	89.1	67.6	8.8	81.8
1935	10.8	52	5.2	1.8	3.0	2.3	3.3	2.3	18.8	.7	.6	2.1	50.9	113.8	24.3	84.3	252.7	81.7	66.0	7.2	80.4
1934	11.0	57	5.4	2.4	3.8	2.1	4.5	2.4	14.9	.5	.7	.9	52.3	111.6	24.3	79.0	248.5	79.8	70.6	10.2	84.5
1933	10.6	56	5.5	2.4	1.6	2.1	2.8	2.7	23.7	.7	.9	1.0	54.5	107.5	23.1	78.1	228.6	72.0	68.7	9.3	82.6
January–March:																					
1936	12.5	58	5.8	.9	.9	3.6	2.0	2.2	36.4	.2	.6	3.4	53.0	114.6	30.4	98.4	311.5	142.4	62.3	4.8	92.4
1935	11.9	63	6.0	.9	5.0	3.2	3.8	2.4	44.2	.2	.6	2.4	54.0	110.4	27.1	90.6	279.5	127.3	63.1	4.2	87.4
1934	11.9	64	6.0	.9	5.6	3.3	4.1	2.5	27.6	.3	.6	1.0	54.5	108.6	27.3	86.1	280.1	122.0	63.7	5.7	93.2
1933	11.8	66	6.2	1.2	1.9	3.1	2.7	2.5	64.7	.3	.7	1.6	58.0	106.0	26.7	86.8	252.7	112.0	60.7	5.5	89.2
April–June:																					
1936	11.3	52	5.3	1.0	1.1	2.7	1.9	1.2	22.8	.1	.6	2.9	53.0	115.6	25.6	87.5	275.6	87.0	64.2	5.6	83.5
1935	10.9	53	5.5	1.2	6.2	3.0	4.9	1.4	14.3	.3	.8	2.9	54.4	115.4	23.6	84.0	255.6	84.1	67.2	7.5	82.6
1934	11.1	59	6.2	1.7	7.5	2.4	5.3	1.4	12.4	.4	.6	1.0	56.0	112.8	24.5	79.4	250.0	81.4	69.9	8.2	86.5
1933	10.4	54	5.8	1.6	3.2	2.4	2.7	1.3	12.3	.4	.7	1.2	58.2	106.9	22.7	78.3	224.2	61.5	68.6	8.6	83.8
July–September:																					
1936	10.3	46	4.7	2.7	.3	.7	1.8	1.2	4.6	.7	.6	1.1	49.1	115.0	22.4	79.4	239.1	36.9	77.0	13.7	71.1
1935	9.6	43	4.7	3.3	.8	1.0	2.6	1.6	4.6	1.6	.6	1.5	47.6	112.6	21.2	74.2	216.4	36.4	70.2	10.7	71.0
1934	9.9	52	5.0	4.2	1.4	.8	5.0	1.5	4.6	1.0	.9	.7	48.8	111.3	20.8	70.4	212.9	36.4	81.1	17.1	76.1
1933	9.4	48	5.2	4.1	.4	.8	3.2	1.7	4.6	1.3	1.1	.6	50.8	107.2	19.7	67.1	193.4	33.4	77.4	14.4	73.3
October–December:																					
1936	11.3	56	4.4	1.9	.2	1.4	2.0	2.7	17.0	.7	.4	1.6	48.2	120.4	26.1	87.1	281.0	90.4	66.6	10.9	80.3
1935	10.9	49	4.9	2.0	.3	1.9	1.8	3.6	12.5	.7	.5	1.7	47.6	116.8	25.3	88.6	260.1	80.2	63.2	6.4	80.8
1934	10.9	55	4.7	2.6	1.0	2.0	3.5	4.1	15.3	.4	.6	.8	49.8	113.6	24.0	80.4	251.6	80.5	67.4	9.9	82.3
1933	10.8	55	4.9	2.7	.8	2.1	2.6	5.3	14.2	.6	.9	.8	50.8	109.9	23.4	80.5	244.7	81.8	68.0	8.7	84.0

[1] Includes all States for which data are available by quarters for the 4 years covered. For a few causes 1 to 3 States were omitted because of missing data. The States are Connecticut, District of Columbia, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin.

TABLE 3.—*Death rates for all causes and birth rates (exclusive of stillbirths) per 1,000 population*

	Deaths, all causes					Births, exclusive of stillbirths				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (25 States) [1]	11.3	10.8	10.9	10.5	10.7	16.2	16.4	16.4	16.0	17.1
Alabama	10.9	([2])	10.2	9.5	9.9	21.3	([2])	21.8	20.6	22.4
Connecticut	10.1	10.1	10.0	10.1	10.0	12.4	12.4	12.4	12.7	13.6
District of Columbia	14.7	14.3	14.7	14.5	15.1	19.0	18.3	17.9	18.6	19.4
Georgia	11.9	11.0	11.4	10.1	10.7	19.4	19.9	20.8	19.5	21.2
Idaho	10.8	10.1	10.0	9.2	9.0	21.4	20.4	20.3	18.2	19.6
Illinois	11.8	10.9	11.2	10.6	10.8	14.3	14.3	14.1	13.5	14.4
Indiana	11.7	11.0	11.9	10.8	11.2	14.2	14.0	15.4	13.9	14.8
Iowa	9.9	10.3	10.5	10.1	10.1	16.7	15.8	16.0	15.2	15.7
Kansas	11.5	10.8	10.7	10.6	10.3	16.2	16.8	17.4	16.6	16.9
Louisiana	12.1	11.1	10.9	10.8	10.9	19.5	19.4	19.5	18.4	20.0
Maryland	13.1	12.7	12.6	12.4	12.7	16.0	16.4	16.6	16.7	17.7
Michigan	11.4	10.8	10.7	10.2	10.4	18.5	18.5	17.7	16.9	18.0
Minnesota	10.7	9.9	10.0	9.6	9.7	16.9	16.4	16.3	15.7	17.5
Montana	11.7	11.8	10.5	9.7	9.8	19.5	19.0	18.7	16.8	16.9
Nebraska	10.0	9.6	9.7	9.3	9.3	17.0	16.6	17.9	17.2	17.9
New Jersey	10.3	10.1	10.3	10.3	10.3	12.3	12.7	12.8	13.3	14.7
New York	11.8	11.5	11.6	11.5	11.5	13.9	14.2	14.3	14.5	15.4
North Carolina	10.4	9.9	10.5	9.2	9.5	22.2	23.3	23.5	22.7	23.8
Pennsylvania	11.0	10.6	10.8	10.6	11.2	15.7	15.8	15.8	15.6	17.1
Rhode Island	12.2	11.5	11.3	11.6	11.8	14.9	14.9	15.2	15.2	16.3
South Carolina	11.2	10.9	11.5	------	------	21.0	21.5	------	------	------
South Dakota	8.9	9.1	9.5	9.0	8.3	18.6	19.0	19.6	18.4	19.2
Tennessee	11.2	10.4	10.6	10.0	10.6	17.0	18.1	18.0	17.6	18.7
Virginia	11.3	10.8	10.9	10.3	10.6	19.0	19.3	19.5	19.6	20.5
Washington	11.7	11.2	10.8	10.4	10.4	13.9	13.7	13.8	12.9	13.4
West Virginia	10.8	10.1	10.0	9.3	10.1	22.3	23.0	23.0	20.4	21.0
Wisconsin	11.3	10.5	10.4	10.0	10.3	17.7	17.6	17.2	16.8	17.7
Hawaii	7.8	7.8	8.3	9.0	9.4	19.7	21.7	22.4	23.8	27.0
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	8.4	8.4	8.5	8.6	8.6	------	------	------	------	------

[1] States not having data for all 5 years are not included in the total for each disease.
[2] Data not available.

TABLE 4.—*Infant mortality and maternal mortality per 1,000 live births*

State	Infant mortality					Maternal mortality				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (25 States)	54	53	58	56	57	5.1	5.3	5.5	5.6	5.9
Alabama	66	([1])	69	66	61	6.7	([1])	6.1	6.9	7.1
Connecticut	43	43	50	49	51	4.5	4.3	5.3	6.0	5.8
District of Columbia	72	59	64	65	73	6.0	6.1	3.6	4.8	7.9
Georgia	70	69	80	68	65	7.9	7.2	7.4	7.7	9.5
Idaho	50	51	50	47	58	3.2	6.2	5.8	2.8	4.4
Illinois	47	46	53	51	52	4.2	4.7	4.8	5.0	5.1
Indiana	53	54	57	55	56	4.7	5.2	5.3	5.7	5.2
Iowa	42	47	53	50	48	4.1	5.4	5.6	4.9	4.4
Kansas	51	49	48	53	48	5.1	5.3	5.5	4.8	5.6
Louisiana	74	68	70	71	66	9.4	8.0	8.1	8.1	8.2
Maryland	68	62	69	65	70	4.3	5.0	5.1	4.9	4.6
Michigan	50	47	52	51	54	4.7	4.9	5.3	5.5	5.6
Minnesota	46	46	49	50	45	4.4	4.9	4.8	4.5	4.3
Montana	53	56	52	49	49	5.5	4.6	5.7	5.8	5.7
Nebraska	44	42	46	51	43	5.6	5.7	5.5	4.2	5.0
New Jersey	44	47	49	46	52	3.8	4.5	5.4	5.1	5.7
New York	47	48	52	54	53	4.9	5.1	5.2	6.3	6.1
North Carolina	67	67	77	66	67	6.5	6.6	6.9	6.4	6.8
Pennsylvania	50	50	54	53	59	4.6	4.9	5.2	5.0	5.6
Rhode Island	49	47	54	56	57	4.1	4.3	5.7	5.4	5.7
South Carolina	80	80	87	------	------	7.9	9.6	9.2	------	------
South Dakota	48	50	59	55	51	4.1	5.5	4.5	4.1	3.7
Tennessee	68	64	75	71	68	7.0	6.9	6.3	5.9	6.6
Virginia	67	64	68	63	64	5.1	5.3	5.7	5.6	6.6
Washington	46	45	43	39	45	5.2	5.2	4.7	6.4	6.2
West Virginia	71	61	67	77	78	5.3	5.2	5.3	5.1	5.1
Wisconsin	47	47	50	49	51	4.0	3.7	4.2	4.7	4.3
Hawaii	73	67	75	72	76	4.5	4.3	5.4	5.8	------
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over.	------	------	------	------	------	7.7	8.7	8.8	9.4	10.5

[1] Data not available.

TABLE 5.—*Death rates for various causes per 100,000 population*

State	Typhoid and paratyphoid fever (1, 2)					Measles (7)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	1.8	2.0	2.5	2.6	3.2	0.6	2.9	4.2	1.6	1.6
Alabama	2.7	(1)	4.6	5.1	7.9	.7	(1)	11.3	.9	.2
Connecticut	.5	.8	.4	.5	.6	.4	1.9	.4	.5	1.0
District of Columbia	1.6	2.7	1.4	3.3	1.3	1.3	(2)	8.6	.7	.2
Georgia	6.2	8.3	10.3	8.2	8.2	.2	.9	17.5	2.0	.5
Idaho	2.5	2.5	5.3	3.9	3.3	2.3	2.1	3.4	.4	.2
Illinois	.9	1.2	1.7	1.4	1.7	.1	3.7	2.7	.7	.7
Indiana	1.7	1.5	3.1	2.7	2.5	.1	2.6	6.6	.4	.4
Iowa	1.2	1.3	2.1	1.0	1.7	.1	6.0	2.7	.2	.2
Kansas	1.7	1.6	1.4	1.5	1.7	.2	12.0	1.9	.7	1.3
Louisiana	7.0	9.1	9.7	11.6	11.1	2.4	6.0	7.8	1.7	1.8
Maryland	1.7	2.7	2.5	2.2	3.1	1.6	1.4	9.0	.2	1.1
Michigan	.8	.7	1.5	1.1	1.2	.3	3.9	.7	2.3	3.8
Minnesota	.5	.6	.5	.8	.7	.9	2.4	1.5	2.7	.5
Montana	1.9	2.4	3.0	2.8	2.8	.6	9.2	5.5	2.6	2.2
Nebraska	.9	.4	1.2	.7	1.4	.7	6.2	1.6	.6	.1
New Jersey	.7	.6	.9	1.0	.7	.3	1.3	1.2	1.7	1.0
New York	.6	.5	.7	.8	1.0	1.0	1.5	.6	2.6	1.6
North Carolina	2.2	2.3	2.6	3.9	5.0	.3	2.0	9.3	2.5	1.8
Pennsylvania	1.0	.8	1.1	1.2	1.8	.3	2.2	2.6	1.2	2.1
Rhode Island	.4	.3	.7	.4	.3	.7	1.0	.4	(2)	6.1
South Carolina	10.0	10.3	8.5	10.1	14.4	.4	1.2	12.7	3.4	2.4
South Dakota	1.6	1.4	2.0	5.0	1.4	.3	4.0	16.9	1.0	(2)
Tennessee	5.0	6.4	7.4	8.6	10.9	.8	1.3	16.0	2.8	.3
Virginia	2.7	2.8	3.2	4.2	5.0	1.1	5.1	5.8	2.0	.8
Washington	1.1	1.0	1.7	1.5	1.9	2.0	1.5	.9	.6	2.3
West Virginia	4.2	5.3	6.9	8.0	12.2	1.6	6.4	3.4	2.5	10.0
Wisconsin	.4	.3	.6	.5	.7	.4	2.5	2.3	.9	1.4
Hawaii	2.0	2.4	3.1	5.0	9.4	6.2	(2)	.2	.5	6.4
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	1.0	1.1	1.5	1.6	1.7	.9	2.5	2.7	1.5	1.7

State	Scarlet fever (8)					Whooping cough (9)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	2.0	2.1	2.0	2.0	2.0	1.9	3.6	5.0	2.9	4.0
Alabama	.5	(1)	.5	.7	1.3	2.6	(1)	12.0	6.2	7.4
Connecticut	.6	1.3	.8	1.4	1.2	1.8	1.2	.9	1.6	2.7
District of Columbia	.3	1.3	1.4	2.4	2.5	8.4	.5	7.0	1.3	3.8
Georgia	.5	.7	.5	.6	.6	2.0	4.9	10.8	7.1	3.7
Idaho	10.3	6.1	2.7	.2	1.7	1.6	6.9	3.2	.2	.6
Illinois	3.0	5.2	3.9	3.6	3.4	1.9	2.7	4.0	1.0	3.0
Indiana	3.3	3.4	3.6	2.5	2.6	1.6	3.9	5.6	2.0	5.0
Iowa	3.1	2.8	2.4	1.8	1.5	1.4	1.7	3.8	2.5	2.0
Kansas	4.1	2.4	1.8	2.1	1.7	.9	2.8	4.8	3.2	2.6
Louisiana	.2	.5	.6	.5	.4	4.7	3.1	10.4	5.7	4.1
Maryland	.7	1.7	1.6	2.4	1.9	5.1	2.6	7.5	4.9	5.5
Michigan	2.4	2.0	3.7	3.4	2.4	2.2	2.8	3.1	3.2	4.2
Minnesota	4.1	3.0	1.2	1.4	1.6	1.2	2.4	4.2	2.8	1.7
Montana	8.7	4.0	2.1	1.9	1.5	3.0	4.3	4.7	3.0	4.1
Nebraska	4.8	2.9	1.8	1.8	2.0	1.7	1.2	6.1	2.0	1.9
New Jersey	.7	.6	1.5	1.4	1.8	1.3	2.3	1.5	1.0	3.0
New York	1.4	1.5	1.2	1.7	2.8	1.1	2.5	1.8	2.3	2.3
North Carolina	.7	.6	1.2	1.4	1.1	1.1	8.8	12.7	5.9	7.0
Pennsylvania	1.6	1.9	2.3	2.7	2.6	1.5	2.0	3.2	1.9	4.3
Rhode Island	1.9	.4	.6	1.3	3.6	1.0	1.2	3.2	3.8	1.6
South Carolina	.6	.3	.5	.8	.5	3.5	9.4	15.8	6.0	7.4
South Dakota	3.6	2.7	1.4	1.6	1.3	.6	4.0	7.9	6.4	6.4
Tennessee	.8	1.0	1.5	1.7	.2	2.5	13.4	9.2	5.5	7.4
Virginia	.5	.9	1.7	2.0	1.2	4.4	7.5	7.8	4.2	12.1
Washington	1.5	1.5	1.6	.9	1.1	.8	1.9	2.6	.3	.9
West Virginia	2.2	4.5	4.4	2.5	2.4	3.9	6.9	11.8	6.0	10.3
Wisconsin	4.4	3.8	1.8	1.3	1.6	1.4	1.8	3.6	2.0	2.2
Hawaii	(2)	(2)	(2)	(2)	.2	.4	2.6	13.3	11.6	1.0
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	2.1	2.6	2.6	2.6	2.8	1.7	2.7	3.7	2.3	3.0

[1] Data not available.
[2] No deaths.

TABLE 5.—*Death rates for various causes per 100,000 population*—Continued

State	Diphtheria (10)					Encephalitis, epidemic or lethargic (17)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	2.0	2.4	2.5	2.8	3.6	0.6	0.6	0.7	0.9	0.7
Alabama	4.0	(1)	5.7	5.6	7.4	.3	(1)	.5	1.1	.5
Connecticut	.4	1.0	.4	1.0	1.0	.2	.3	.4	.8	.7
District of Columbia	4.5	4.7	2.7	2.6	3.0	.6	.8	.5	.4	1.7
Georgia	3.8	5.2	6.0	6.1	5.6	.3	.1	.3	.2	.4
Idaho	.6	.6	2.7	1.7	3.0	1.2	2.5	1.9	(2)	.6
Illinois	2.2	2.6	2.0	1.7	3.1	.4	.5	1.1	.5	.7
Indiana	2.9	4.0	3.5	4.3	4.9	.6	.7	1.0	1.4	.7
Iowa	.9	2.1	1.6	2.1	2.3	.5	.7	.8	1.4	1.2
Kansas	2.3	2.1	2.2	3.2	4.0	1.1	1.4	1.4	2.8	.5
Louisiana	4.2	5.3	4.7	4.8	6.7	.2	.4	.3	.2	.4
Maryland	1.6	1.3	1.4	1.8	3.1	1.1	.8	.8	.7	.8
Michigan	1.1	1.2	.8	2.4	2.2	.4	.3	.3	.6	.5
Minnesota	.6	.6	.7	1.0	.9	.6	.9	1.3	1.3	.9
Montana	2.1	2.8	1.9	3.0	.9	.4	.9	.9	.6	1.3
Nebraska	1.5	1.2	1.7	1.5	3.2	.4	.5	.3	1.4	.6
New Jersey	.5	1.1	1.3	1.2	2.4	.8	.6	.7	.8	.8
New York	.5	.8	1.0	1.2	2.3	.5	.6	.5	.7	.8
North Carolina	5.5	4.6	6.2	5.9	4.6	.4	.4	.5	.4	.6
Pennsylvania	1.3	1.5	2.2	2.3	4.0	.6	.7	.6	.7	.7
Rhode Island	.1	.7	.3	1.3	4.2	.3	.1	.1	.7	.7
South Carolina	4.0	3.3	4.3	5.0	4.8	.2	.8	1.9	1.7	1.3
South Dakota	.7	1.7	1.0	2.3	2.9	.3	.6	.3	.6	.4
Tennessee	5.3	6.4	7.3	7.9	8.1	.9	.5	.9	.9	.4
Virginia	3.8	4.3	5.6	6.0	5.2	.4	.5	.6	.4	.6
Washington	.4	.7	.5	1.5	1.2	2.4	1.6	1.7	.9	1.4
West Virginia	7.1	8.7	9.4	10.6	13.4	.5	.6	.5	.3	.4
Wisconsin	.5	.4	.9	.6	1.9	.8	.8	.5	.6	.8
Hawaii	1.6	.7	.5	1.7	4.6	.7	.2	.2	(2)	.2
Industrial policy holders Metropolitan Life Insurance Co., ages 1 and over	1.8	2.2	2.1	2.6	3.9					

State	Influenza (11)					Pneumonia, all forms (107–109)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	21.5	19.7	15.8	24.2	27.0	89.7	81.7	80.4	71.5	78.9
Alabama	48.5	(1)	26.1	31.8	45.4	97.8	(1)	78.9	57.6	65.5
Connecticut	8.0	8.6	7.2	21.0	15.0	70.3	65.1	62.2	71.6	64.4
District of Columbia	7.6	11.4	6.8	9.0	14.6	138.9	127.3	116.8	105.3	127.0
Georgia	58.9	43.0	31.8	40.5	38.2	120.3	95.8	97.2	74.3	81.4
Idaho	19.0	17.1	14.0	18.0	20.4	110.5	95.6	97.3	70.0	74.6
Illinois	14.5	15.7	10.8	15.5	24.6	80.4	77.9	75.8	63.8	68.9
Indiana	28.1	24.7	21.9	29.3	41.9	97.0	86.4	83.3	65.0	83.7
Iowa	19.9	21.0	17.6	32.9	35.6	71.2	76.2	75.8	73.2	78.3
Kansas	47.3	31.2	19.5	46.5	42.3	84.3	79.4	59.2	54.2	54.4
Louisiana	49.5	24.2	20.5	33.0	53.9	120.0	87.2	74.3	65.2	77.6
Maryland	11.7	14.7	9.0	17.6	20.4	111.0	100.7	99.0	95.7	104.4
Michigan	12.0	15.1	11.4	18.1	23.9	85.4	80.4	73.8	58.1	68.1
Minnesota	14.2	15.8	14.5	24.4	30.9	85.0	76.5	80.9	58.6	69.1
Montana	24.3	42.0	26.7	36.0	41.9	121.5	122.8	82.5	63.8	63.9
Nebraska	21.3	22.7	17.8	35.1	37.6	72.0	78.2	74.9	71.3	62.7
New Jersey	7.9	9.2	7.3	12.3	14.3	67.7	63.2	66.0	71.1	62.6
New York	6.5	6.8	7.0	13.4	13.1	88.9	85.4	88.0	94.4	99.0
North Carolina	32.2	28.3	21.1	28.2	20.7	100.7	90.4	99.8	63.7	81.4
Pennsylvania	16.1	18.1	15.1	25.1	29.3	82.5	79.8	80.0	69.8	81.4
Rhode Island	9.1	8.5	7.9	18.2	11.7	95.9	79.4	74.9	79.5	96.6
South Carolina	49.8	44.2	41.1	36.3	49.8	103.6	87.4	92.9	84.7	97.1
South Dakota	20.2	31.6	29.6	45.8	29.2	66.2	96.1	85.1	62.0	47.1
Tennessee	54.4	39.9	34.2	38.4	16.7	117.3	95.4	89.2	75.0	86.0
Virginia	38.0	35.2	25.4	35.4	36.2	94.0	78.7	74.4	63.4	69.4
Washington	26.0	16.2	13.7	24.7	33.2	76.9	56.8	54.2	49.2	54.3
West Virginia	33.8	31.1	26.4	33.5	47.6	109.3	84.1	79.1	64.2	79.4
Wisconsin	15.9	19.3	12.0	26.2	29.3	77.0	65.5	69.8	52.7	68.4
Hawaii	11.9	13.2	13.7	6.9	10.9	68.0	69.4	110.4	92.1	96.9
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	14.6	14.7	11.4	20.3	19.1	69.8	66.1	65.0	62.5	65.4

1 Data not available.
2 No deaths.

TABLE 5.—*Death rates for various causes per 100,000 population*—Continued

State	Acute poliomyelitis and polioencephalitis (16)					Epidemic cerebrospinal meningitis (18)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	0.4	0.8	0.6	0.6	0.7	2.2	2.0	0.9	1.0	1.3
Alabama	1.3	(1)	.6	.4	.3	.9	(1)	.4	.4	.5
Connecticut	.1	1.3	.1	.2	.4	.7	1.0	.4	.5	.7
District of Columbia	.3	1.7	.5	.4	1.1	10.5	15.8	.9	2.0	2.5
Georgia	.9	.5	.7	.7	.9	2.1	1.0	.6	.4	.8
Idaho	1.0	.8	3.2	.9	.2	6.0	4.6	2.7	1.5	3.0
Illinois	.9	.5	.4	.4	.5	2.2	2.6	1.5	2.7	2.0
Indiana	.4	.3	.6	.3	.2	2.1	2.5	.6	1.4	3.8
Iowa	.5	.4	.3	1.6	1.9	2.0	2.0	1.1	1.4	.9
Kansas	.6	.5	.6	.7	.6	1.1	2.2	1.1	1.1	1.3
Louisiana	.5	.8	.4	.4	.5	1.8	.8	.6	1.2	1.2
Maryland	.1	.2	.4	.2	.4	7.1	5.2	.2	1.1	1.1
Michigan	.4	.7	.5	.1	.5	1.2	.9	.6	.7	1.4
Minnesota	.2	.4	.8	1.3	.5	1.9	1.7	.8	1.2	.9
Montana	.6	.2	3.2	.4	1.1	4.3	2.6	1.7	.6	1.3
Nebraska	.7	.7	.7	.3	.9	1.4	2.8	1.3	.6	.5
New Jersey	.8	.8	.3	.6	1.1	1.8	.7	.5	.6	.8
New York	.1	1.1	.4	1.1	.5	2.2	2.2	.7	.7	1.3
North Carolina	.3	2.0	.4	.4	.5	1.6	.8	.4	.3	.5
Pennsylvania	.2	.3	.3	.6	1.5	1.2	1.2	.7	.9	1.3
Rhode Island	(2)	3.5	.1	.1	.4	3.1	2.3	.7	.1	.4
South Carolina	.9	.7	.6	.7	.6	2.5	1.2	.6	1.9	1.3
South Dakota	.1	1.0	1.4	.9	1.2	.6	.4	.4	.1	.4
Tennessee	1.5	.8	1.2	1.2	.6	3.6	3.8	1.4	.9	1.4
Virginia	.4	1.6	.7	.4	.6	5.2	3.8	1.4	.9	1.1
Washington	1.0	.6	3.4	.9	.9	1.5	2.1	1.0	1.1	1.6
West Virginia	1.2	.6	.9	1.2	.7	5.8	3.6	2.1	.9	1.1
Wisconsin	.1	.2	.6	.4	.4	1.0	1.2	.7	.5	1.0
Hawaii	.2	(2)	.2	.5	.8	1.6	.7	1.9	.7	2.8

State	Tuberculosis, all forms (23-32)					Cancer, all forms (45-53)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total (26 States)	51.2	51.2	52.7	54.8	58.0	112.4	110.0	107.9	103.9	101.2
Alabama	63.9	(1)	61.2	67.3	74.4	59.3	(1)	54.0	54.4	53.2
Connecticut	38.6	41.9	41.4	46.3	48.2	125.1	126.4	124.7	123.8	117.8
District of Columbia	106.6	102.2	108.7	113.6	113.9	136.7	131.0	135.3	136.3	137.5
Georgia	55.1	55.7	57.2	58.4	64.2	56.0	54.8	56.8	53.6	51.3
Idaho	24.5	24.6	27.3	29.8	27.8	70.6	66.8	71.5	79.4	68.0
Illinois	51.6	52.1	52.7	53.8	55.3	131.1	128.4	123.7	118.6	116.9
Indiana	47.0	46.2	51.4	53.6	57.0	108.0	109.9	112.2	102.3	104.6
Iowa	22.2	25.7	24.5	25.3	28.0	120.8	126.2	124.0	121.5	115.7
Kansas	29.0	28.8	27.4	30.8	33.1	117.2	111.2	115.1	109.6	106.0
Louisiana	72.6	72.2	76.2	74.2	74.8	80.7	80.3	73.3	73.0	69.0
Maryland	82.9	81.1	80.2	82.2	91.4	128.7	130.3	127.6	121.0	117.6
Michigan	43.9	43.2	46.9	49.6	51.9	115.7	109.6	109.9	103.5	100.4
Minnesota	35.6	34.6	34.7	37.7	39.3	133.5	131.1	130.0	130.4	124.7
Montana	41.2	46.9	49.7	50.7	55.3	106.0	97.4	88.5	92.1	93.5
Nebraska	18.0	22.4	22.2	22.0	20.6	113.0	108.5	111.5	103.1	102.4
New Jersey	50.2	50.1	52.6	56.5	61.8	127.4	123.8	122.8	119.2	115.2
New York	58.4	57.3	58.8	61.2	64.2	147.3	143.3	136.8	131.8	127.3
North Carolina	60.6	56.6	61.9	63.2	66.0	51.8	50.6	49.9	49.1	46.6
Pennsylvania	44.4	44.4	47.2	48.4	52.4	112.0	107.0	107.0	102.8	102.0
Rhode Island	47.9	51.0	46.3	51.7	54.0	145.2	147.3	137.3	140.4	145.0
South Carolina	53.2	52.1	58.9	57.3	64.2	49.4	47.7	51.4	46.7	40.8
South Dakota	34.4	39.3	34.4	38.9	45.7	88.4	89.7	85.8	83.7	81.6
Tennessee	87.5	84.3	86.7	89.8	93.8	65.8	64.6	63.0	58.2	56.1
Virginia	66.6	69.1	68.5	73.6	78.6	71.1	72.1	70.1	68.8	65.9
Washington	49.8	51.6	47.4	53.6	53.3	131.7	132.2	128.5	121.7	113.4
West Virginia	54.4	57.3	53.7	53.4	56.2	70.6	70.9	67.0	67.0	62.9
Wisconsin	36.2	36.5	38.4	41.7	46.1	132.8	128.7	126.2	119.3	119.8
Hawaii	78.0	68.5	76.9	93.8	91.3	62.9	62.1	57.1	64.6	69.2
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	54.2	55.8	59.4	64.7	69.8	93.5	96.1	96.1	94.6	91.1

[1] Data not available.
[2] No deaths.

TABLE 5.—*Death rates for various causes per 100,000 population*—Continued

State	Diabetes mellitus (59)					Cerebral hemorrhage, apoplexy (82, a, b)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total [3]	25.1	23.4	23.4	22.2	22.3	88.4	84.6	79.4	78.3	79.4
Alabama	12.3	(1)	10.5	9.4	10.0	69.2	(1)	60.1	55.2	58.2
Connecticut	28.3	29.8	25.2	24.1	25.1	-----	-----	-----	-----	-----
District of Columbia	26.7	26.1	33.6	26.9	26.4	100.6	99.5	95.5	105.0	100.8
Georgia	12.5	12.3	12.6	11.4	11.4	82.7	76.7	74.1	70.5	78.4
Idaho	13.6	14.2	12.5	10.3	12.4	73.6	66.2	68.1	71.9	77.8
Illinois	29.2	25.3	28.0	26.3	26.9	79.1	72.8	71.9	73.0	74.6
Indiana	16.4	15.5	18.2	14.2	15.4	127.4	121.8	123.3	103.6	108.1
Iowa	23.2	21.5	24.6	19.2	15.9	105.2	105.7	108.7	110.7	108.2
Kansas	22.9	22.2	24.1	23.6	22.4	102.7	98.9	98.6	101.2	102.9
Louisiana	17.4	15.8	14.1	14.3	14.1	71.3	66.7	57.3	61.6	61.9
Maryland	27.5	26.8	23.9	24.0	26.0	110.6	112.3	104.8	97.0	104.5
Michigan	26.5	26.0	23.5	23.3	23.6	94.8	89.1	91.5	86.9	90.6
Minnesota	25.8	22.1	22.5	20.6	22.3	86.5	82.7	81.9	79.7	78.0
Montana	22.4	19.8	20.0	15.8	15.9	92.1	93.6	76.3	70.2	70.5
Nebraska	24.8	20.5	20.3	16.6	23.2	89.4	99.3	97.9	96.6	94.7
New Jersey	30.6	28.6	27.3	28.9	26.5	80.8	75.9	80.6	82.1	78.9
New York	36.3	32.7	32.3	31.4	31.3	78.7	77.3	51.1	54.4	52.8
North Carolina	11.6	10.1	11.1	10.5	10.8	-----	-----	-----	-----	-----
Pennsylvania	27.4	27.2	26.9	25.7	25.6	86.5	81.9	81.3	82.3	85.6
Rhode Island	33.8	33.3	33.6	35.6	33.1	98.4	96.2	92.7	99.1	105.5
South Carolina	11.0	11.7	11.5	8.0	10.9	106.2	95.6	-----	-----	-----
South Dakota	21.4	19.6	22.5	19.9	17.5	81.9	78.9	74.1	79.5	67.8
Tennessee	11.3	11.5	10.6	10.2	10.0	80.3	77.4	76.8	64.7	64.3
Virginia	15.4	15.2	16.2	14.1	15.3	95.7	95.1	90.2	92.0	88.3
Washington	25.3	23.3	21.5	20.3	20.0	103.8	98.7	94.9	86.8	88.2
West Virginia	14.6	13.4	11.3	11.3	13.2	78.6	71.2	78.6	68.0	77.2
Wisconsin	29.7	25.8	24.8	24.2	23.0	98.0	88.4	88.1	87.1	89.8
Hawaii	16.9	15.1	15.7	14.8	9.2	43.7	39.8	36.6	46.8	50.1
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	24.6	24.4	24.4	24.1	23.0	61.9	61.2	63.2	63.8	62.1

State	Diseases of the heart (90–95)					Nephritis, all forms (130–132)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total [4]	276.7	253.0	248.4	228.9	221.9	81.9	80.7	84.7	82.4	85.5
Alabama	147.5	(1)	142.3	121.5	116.8	79.3	(1)	77.7	76.3	82.0
Connecticut	238.4	221.7	213.8	205.3	208.1	84.8	86.8	85.6	83.5	87.8
District of Columbia	338.4	330.6	347.3	312.0	309.9	96.9	100.7	111.6	117.5	131.6
Georgia	180.1	163.7	161.8	130.6	137.2	108.3	100.8	105.5	102.3	107.5
Idaho	186.4	159.1	149.9	155.6	157.0	25.2	34.9	34.2	33.9	42.2
Illinois	317.6	276.7	270.0	256.6	236.7	102.0	96.8	104.7	103.4	111.2
Indiana	265.5	254.2	264.4	173.0	173.1	74.3	64.7	75.1	71.5	69.3
Iowa	231.7	225.7	206.5	193.9	197.0	59.9	62.3	65.6	40.5	44.7
Kansas	241.8	217.0	207.4	196.8	181.0	97.1	92.4	96.5	95.2	101.7
Louisiana	198.9	183.6	186.7	191.2	187.6	107.7	108.1	110.4	97.5	105.3
Maryland	304.6	273.5	270.7	261.0	259.4	142.4	137.4	141.1	147.2	140.3
Michigan	278.9	262.8	251.0	242.2	234.6	63.5	62.9	66.1	63.6	62.2
Minnesota	244.0	213.9	213.0	197.2	194.3	48.1	48.4	51.7	54.5	54.9
Montana	193.8	205.5	179.3	180.1	159.6	73.8	78.7	71.0	69.2	71.8
Nebraska	220.6	189.7	184.6	178.9	174.5	69.6	51.5	60.6	58.3	73.3
New Jersey	301.9	285.1	284.7	268.0	235.8	75.6	79.0	82.6	85.7	92.9
New York	349.8	318.4	322.8	299.1	300.6	78.7	80.3	84.6	79.1	76.7
Pennsylvania	292.8	271.7	263.3	244.9	238.1	82.0	83.1	88.7	92.6	92.9
Rhode Island	355.1	328.3	312.3	289.3	272.7	107.2	103.8	111.7	117.0	120.7
South Carolina	177.8	180.4	-----	-----	-----	93.8	92.6	104.6	81.8	123.2
South Dakota	153.6	139.6	146.0	147.4	152.0	60.5	61.1	63.0	50.9	42.2
Tennessee	161.3	142.6	144.0	111.1	97.3	67.9	63.1	62.0	60.5	66.4
Virginia	231.4	208.0	206.0	183.3	177.6	91.5	86.3	87.4	85.0	91.4
Washington	277.0	264.6	244.3	243.3	217.1	74.3	79.2	75.2	74.9	83.7
West Virginia	170.5	150.2	124.3	116.2	114.6	67.3	69.5	64.9	78.0	69.8
Wisconsin	290.8	256.4	239.9	229.3	223.7	68.8	70.0	69.8	67.3	68.4
Hawaii	119.4	100.5	92.8	109.2	96.9	62.2	67.3	61.7	72.5	58.3
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over [5]	160.6	158.1	162.9	161.5	155.5	59.2	60.2	64.9	67.1	68.7

[1] Data not available.
[3] Diabetes mellitus includes 26 States; cerebral hemorrhage, apoplexy, 23 States.
[4] Diseases of the heart includes 24 States; nephritis, all forms, 25 States.
[5] Heart diseases in data for industrial policyholders exclude pericarditis, acute endocarditis, acute myocarditis, and angina pectoris; nephritis data for industrial policyholders include only chronic nephritis.

TABLE 5.—*Death rates for various causes per 100,000 population*—Continued

State	Diseases of the digestive system (115-129)					Diarrhea and enteritis (under 2 years) (119)				
	1936	1935	1934	1933	1932	1936	1935	1934	1933	1932
Total [6]	67.5	65.9	70.4	68.6	68.8	9.3	7.8	10.8	9.7	10.1
Alabama	68.0	(1)	73.0	69.0	67.1	17.5	(1)	19.9	18.2	14.8
Connecticut	-------	-------	-------	-------	-------	2.6	1.7	5.0	4.6	4.1
District of Columbia	84.2	90.2	93.2	102.4	95.1	15.0	9.9	12.7	10.5	15.0
Georgia	72.6	72.5	80.3	70.7	67.4	17.5	15.8	21.3	16.2	12.9
Idaho	64.7	60.5	74.8	58.8	56.3	7.2	2.5	11.0	1.9	2.0
Illinois	72.6	69.1	75.9	71.1	72.5	6.5	4.4	8.4	6.4	7.0
Indiana	-------	-------	-------	-------	-------	8.9	6.3	12.0	10.7	11.3
Iowa	56.9	61.0	65.4	55.8	60.2	4.4	3.9	6.8	2.7	3.1
Kansas	72.2	70.7	79.3	74.2	71.6	6.8	6.5	8.3	8.6	7.4
Louisiana	81.8	81.5	78.4	78.8	71.1	17.4	17.5	21.6	19.4	14.4
Maryland	70.3	70.8	71.1	72.5	77.3	16.1	14.0	17.7	17.1	20.5
Michigan	75.2	67.3	74.6	69.0	69.7	9.8	4.5	8.2	6.2	6.8
Minnesota	62.2	63.2	68.3	61.4	60.2	4.6	3.8	4.0	4.9	3.9
Montana	88.5	84.0	84.2	74.7	71.0	11.5	8.1	13.4	5.1	5.0
Nebraska	74.6	65.6	72.7	65.3	65.7	4.8	3.7	5.6	4.8	5.0
New Jersey	58.2	57.0	59.3	62.4	62.3	3.4	3.4	5.3	4.3	5.7
New York	68.3	67.0	69.4	71.3	67.4	6.1	6.2	6.8	7.0	6.6
North Carolina	-------	-------	-------	-------	-------	23.5	22.0	26.6	20.6	17.0
Pennsylvania	53.7	55.7	60.7	62.2	66.1	5.8	5.5	8.3	8.6	12.3
Rhode Island	61.2	66.2	62.7	68.2	70.5	3.8	5.3	4.3	4.4	8.3
South Carolina	41.6	36.1	44.8	-------	-------	16.2	7.3	-------	-------	-------
South Dakota	60.4	59.0	66.2	57.9	63.9	10.1	7.8	9.4	8.2	6.5
Tennessee	80.3	77.9	87.8	85.0	81.6	20.4	18.9	25.4	23.3	20.1
Virginia	57.8	55.4	62.1	58.4	63.0	13.3	10.8	16.3	15.3	14.4
Washington	66.3	65.3	63.1	61.6	56.7	3.3	3.7	2.8	2.1	2.3
West Virginia	92.1	76.8	79.8	82.5	103.0	34.3	20.1	28.0	32.7	49.6
Wisconsin	-------	-------	-------	-------	-------	6.2	4.6	6.8	6.8	7.0
Hawaii	64.8	64.2	74.9	103.0	102.8	20.1	18.6	27.2	34.4	44.3
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	-------	-------	-------	-------	-------	6.1	5.8	8.1	7.5	8.1

[1] Data not available.
[6] Diseases of the digestive system includes 21 States; diarrhea and enteritis (under 2 years), 25 States.

TUBERCULOSIS CONTROL BY A SMALL COUNTY HEALTH DEPARTMENT [1]

Brunswick-Greensville Health Administration Studies No. 8

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This study represents a further attempt to determine what part of the total health problem confronting the people is touched in some way by a small county health department. Inasmuch as the control of tuberculosis in these two counties constitutes a large part of the total health problem, it has been selected for special investigation. An analysis of this field of activities offers at the same time a good basis for studying county health administration, since a program of tuberculosis control involves not only active participation by the health department but also the utilization of such assistance as may be available through other agencies.

The two Virginia counties under consideration, Brunswick and Greensville, are classed as entirely rural, since there is no town of 2,500 or more inhabitants in either. The total population of the area

[1] From the Division of Public Health Methods, National Institute of Health, in cooperation with the Division of Domestic Quarantine.

is about 34,000. This population is distributed between the counties and races as follows: Brunswick—total 20,486, white 8,994, Negro, 11,492; Greensville—total 13,388, white 5,259, Negro 8,129.

FACILITIES AND THE FACTORS INFLUENCING THEIR USE

A single health department, consisting of one full-time medical officer, two nurses, one sanitation officer, and a clerk, is responsible for public health service in all political units of the two counties. Eighteen physicians who reside in the area are general practitioners, but among this group there is no one especially familiar with the clinical aspects of pulmonary tuberculosis. An itinerant clinic unit of the State health department, which visited the area on four occasions during the study period, afforded the only skilled diagnostic service that was available locally. A relatively few persons suspected of having tuberculosis of the bones or joints were referred to an orthopedic surgeon who visited each county seat once every month. Local civic groups sponsored this clinic, which was organized originally for crippled children.

The county depends almost exclusively on the State for hospitalization of the tuberculous. State sanatoria, 1 for Negro and 2 for white patients, have a combined capacity of 765 beds. For the State as a whole the ratio of total sanatorium beds to deaths from tuberculosis is 0.73. Since this ratio is considerably less than one bed per annual death, it is not surprising that the local health officer should experience on the average a delay of 3 months in securing admission for persons selected for institutional care. Another barrier between patients and sanatoria lay in the fact that a charge of $1 per day is made for the care of white patients and 50 cents for Negroes. If a patient should be unable to meet such payments, the county authorities or the local charities are petitioned for funds. All these limitations seem to have exerted an influence on the number of persons admitted to State sanatoria, since only nine were accommodated. Patients of the two counties are reported to have obtained 1,260 days of sanatorium care during the study year. This would be the equivalent of about 40 days per death, or approximately 32 percent of standard practice.[2] The local need for hospital care apparently exceeded the facilities used, since the State clinic alone urged sanatorium care for 16 patients and compromised on rest for 43 others. Further data to be presented later suggest that cases in addition to those diagnosed by the State clinic were in need of bed care but could not be placed in an appropriate institution. It would therefore appear that the local program was embarrassed not alone by inadequate sanatorium facilities but, in addition, by inability of the counties to

[2] Appraisal Form for Rural Health Work, second edition, 1932, American Public Health Association.

utilize the full number of beds in State institutions which, on the basis of population, might be regarded as a quota for the area.

A further handicap to the program is to be found in the social and economic situation of many families. The general level of income is low in both counties. When resources are expressed by annual per capita spendable money income[3] it is found that Brunswick, with $172, is considerably below the median, $245, for all counties of the United States having county health department services. Greensville, on the other hand, has a spendable money income of $253, which corresponds very closely to the midpoint just quoted. Generally speaking, the Negro population is poorly housed, and on many farms the dwellings of white tenants likewise are inadequate. Considerable overcrowding must exist among the Negroes, since the average number of individuals per family is 6.1, and the same families have on the average only 4.2 rooms. These unfavorable circumstances of the Negroes are reflected in any statistical description of the area or its problems, since the Negroes comprise more than 50 percent of the total population.

AMOUNT OF TUBERCULOSIS PRESENT

The sources of information first consulted in regard to the incidence of tuberculosis were the registers maintained by the local and the State health departments. The local register contained the names of 168 individuals, while 165 were on the State list. Wide discrepancies between the lists were found when an effort was made to compare names and addresses. A precise medical diagnosis had not been established in a fairly large proportion of instances. Furthermore, individuals were not always placed in descriptive categories, such as active or arrested cases, suspects, or contacts. Without a vigorous case-finding program supported by medical diagnosis the registers could not be expected to present the true prevalence of tuberculosis. For reasons stated above and others that will appear later, the tuberculosis case registers were not used as a basis for defining the problem or in appraising the program of the health department.

After exploring other possible sources of information, it was decided to adopt the case-death ratio for establishing the probable incidence of tuberculosis. Since normal variation in the number of deaths produces a disproportionately great fluctuation in rates for small populations, an annual average computed on a period of several years gives a more reliable figure.

According to the records of the State Registrar of Vital Statistics, tuberculosis was given as a cause of death for 332 persons dying in

[3] Survey of Spending Power. Sales Management, Apr. 10, 1935. Spendable money income is defined as money received for goods and services produced and rendered during the calendar year 1934, plus Federal allotments, and the money paid out of savings and surpluses of business institutions.

Brunswick and Greensville Counties during the 10 years preceding the study. In the latter half of this period the annual average number of deaths was 31. Deaths in Virginia are allocated according to place of death rather than legal residence of decedent; consequently there is no practical way of determining exactly how many residents may have died outside of the counties or how many deaths of nonresidents are included in the local reports. It is believed that 31 may be taken as a minimum statement of the number of deaths due to tuberculosis that may be expected to occur annually in the two counties.

By using the average annual experience of the preceding 5 years, it was found that these 31 deaths should be distributed between the races and between the counties about as follows: White 6, Negro 25; Brunswick 14, Greensville 17. When expressed in rates per 100,000 population, the figures become: White 48.9, Negro 135.3; Brunswick 68.6, Greensville 125. The discrepancy in county rates is attributable in the main to differences in Negro rates of the two political units, but the reason for the excess of deaths in one Negro group over the other is not understood. Quite likely it is due to chance or to variation in recording practice, since the two counties are strikingly similar in most respects; furthermore, their rates for the preceding 5 years were very nearly alike. While some importance may be attached to differences in county rates, the two areas are treated as a unit, since they constitute one health jurisdiction.

If the figure 31 is accepted as representing approximately the average annual number of recorded deaths, then one would be conservative in stating that there are in the two counties not less than 150 active cases of tuberculosis which should have been known to the health authorities. This estimate is based on the ratio of 5 active cases per annual death, which represents the experience in rural areas [4] where case-finding programs are in keeping with good county health department practice. Cattaraugus County,[5] New York, where a concerted effort was made to locate tuberculous persons, also reported essentially the same ratio of cases to deaths. Under urban [6] conditions with perhaps better than average case-finding machinery, it has been possible to locate 7.3 active cases per annual recorded death. According to general experience, the number of arrested cases equals at least those showing activity. If this minimum proportion remains true for Brunswick and Greensville Counties, then the number of cases, active and arrested, should total about 300. Each of these cases presumably was closely associated with 5 other individuals,

[4] See reference 2.

[5] Douglas, Stephen A.: The Organization of a Rural Tuberculosis Service. Milbank Memorial Fund, 1930.

[6] Doust, H. B.: The Tuberculosis Program in Syracuse. Transactions of the Twenty-Seventh Annual Meeting (1931), National Tuberculosis Association.

within the household or elsewhere; and, as a result, not less than 1,500 persons must have been sufficiently exposed to be classed as contacts.

TABLE 1.—*Distribution of individuals served according to health department classification of clientele*

	Health department classification of clientele				
	Cases	Suspects	Contacts	Other	Total
Number	99	51	248	62	460
Percent	22	11	54	13	100

FRACTION OF PROBLEM REACHED BY PROGRAM

A total of 460 individuals drawn from 201 families were touched in some way by the tuberculosis program during the study period. The distribution of these individuals according to the classification used is shown in table 1. Records of the health department revealed that, while 99 individuals were classed as cases, this number includes some whose process was not active and a few with nonpulmonary tuberculosis. The group termed "Other" is made up of persons who were not in contact with known cases but who desired a physical examination or service of some other type which was rendered as part of the tuberculosis program. If the 51 suspects are added to the 99 diagnosed cases, the resulting total, or 150 individuals, should represent not more than 50 percent of the estimated number of active and quiescent cases. Very likely the 248 contacts cannot be more than 20 percent of the persons who were exposed to the disease in an intimate way.

Further analysis of the data pertaining to residence and characteristics of the clients suggests that in proportion to deaths the white population received more attention than the Negroes and that the volume of service based on population was larger in Brunswick than in Greensville County. The percentages of individuals served that fell into the age groups 10–19 and 20–29 were greater than the percentages in the general population of corresponding maturity. Perhaps there was a conscious selection of persons for service from those age levels where early tuberculosis is likely to manifest itself with greatest frequency.

Information as to economic status was recorded for only 117 of the 201 families represented in the tuberculosis service. Of the known group, 78.5 percent were in either the poor or the very poor class, whereas only 50 percent of the surveyed families[7] fell into these economic categories. Very likely the apparent preference shown the poor and very poor signifies good practice since tuberculosis as a rule is more prevalent among those having low incomes.

[7] Unpublished data from a survey of 1,009 families.

SOURCE OF CLIENTS

From the records completed during the study year it was possible to determine the method by which the health department discovered its clientele. These data are presented in table 2. The families of tuberculous patients proved to be the most fruitful source of information, accounting for 51 percent of all new individuals and 36 percent of the new cases that came to the attention of the health department. Nearly one-third of the actual cases were reported by private physicians. A great majority of these were registered as patients referred to the clinic that was operated by the State health department. Contacts and suspects traceable to cases reported by physicians appear in most instances to have been located directly by the health department staff after service was established with tuberculous members of the household.

TABLE 2.—*Distribution of clients according to source of first information, and health department classification*

Source of first information	Health department classification of clientele					
	Cases	Suspects	Contacts	Other	Total	
					Number	Percent
Family of patient	26	9	119	20	174	51
Private physician	22	7	5	3	37	11
Death in family	8	10	68	0	86	25
Neighbor, friend, or teacher	10	5	16	2	33	10
Sanatorium	3	0	1	0	4	1
Other	3	1	3	2	9	3
Total	72	32	212	27	[1] 343	100

[1] Source of first information unknown for 117 patients.

SERVICE RENDERED

The State tuberculosis clinic and the county health department nurses were responsible for practically all the field service that was performed by the public agencies. This may be noted in table 3. Roughly, half of the clients were registered at the chest clinic and two-thirds of them were visited by the county nurses. However, only 95 individuals, or about 21 percent of the 460 individuals served, received both types of service. The clinician saw half of the cases, somewhat less than half the contacts, and exactly three-fourths of those classed as suspects. Approximately two-thirds of the cases, three-fourths of the contacts, and three-fifths of the suspects were visited by the nurses.

TABLE 3.—*Distribution of clients*[1] *according to health department classification and to type of service*

Classification of clientele	Total	Type of health department service							
		Chest clinic		Orthopedic clinic		Public health nurse		Other	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Case	99	49	50	10	10	66	67	2	2
Suspect	51	38	75	1	2	31	61	1	2
Contact	248	107	43	0	0	180	72	0	0
Other	62	47	76	0	0	29	47	0	0
Total	460	241	52	11	2	306	63	3	1

[1] Some individuals received more than 1 type of service.

In the combined clinic and nursing service, 1,029 client contacts were recorded; 260 of these, or about 25 percent, were made by the chest clinic, and 676, or 66 percent, were field visits of the nurse. The remaining 9 percent were accounted for primarily by attendance at the orthopedic clinic. While the average number of visits, both clinic and nursing, was 2.2 per individual, actual cases of tuberculosis received 3.1 visits, suspects 2.5, contacts 2.0, and others 1.8 visits each. These averages fail to disclose the wide variation in intensity which characterized the service. About one-third of the clinic cases and well over half of the household contacts were seen only once during the study year. In general, the concentration of service was rather low, but health department effort appeared to be distributed fairly well according to the relative needs presented by these individuals.

STATE CLINIC

The mobile diagnostic unit of the State health department visited the area four times during the study year, and held seven clinic sessions, four in Brunswick and three in Greensville County. These sessions were attended by 241 individuals drawn from 140 families. Brunswick County registered 177 persons and Greensville 64; thus, it will be seen that people of the former county patronized the service more freely than those of the latter. The proportion between the races was 79 white to 162 Negro; this, generally speaking, is in keeping with the relative importance of the tuberculosis problem among each race. Slightly more members of Negro than white families attended the clinic, the average number being 1.8 members per Negro family as compared with 1.5 for the white. Distinctly more people in the age group 10–19 than in any other 10-year age group were attracted to the clinic. As already pointed out, this selection is characteristic of the general program and should be expressive of good practice, since ado-

lescence is the period of life when clinical tuberculosis is most likely to manifest itself for the first time.

Practically all the patients came to the clinic but once during the year, only 17 attended two sessions, and just 1 made 3 visits. This performance did not reflect the advice given by the clinician. Reexamination was recommended to 119 patients seen during the study year, and 78 who had attended previously were specifically instructed to return during the study year. The latter group particularly should have been well represented among the return visits during the study year; yet only 55 percent of those patients actually came back.

As stated previously, 241 individuals attended the State clinic during the year under consideration. Table 4 shows the distribution of these persons according to medical diagnosis. Pulmonary tuberculosis was definitely identified in 43 individuals; but it was not possible from the records to classify these cases on the basis of activity in the disease process. After further examination very likely a number of those classed as "Pulmonary tuberculosis suspected" will be placed in the group with positive diagnosis; consequently, the department probably located more tuberculous individuals than is indicated by the number 43. The nontuberculous group is composed of 107 contacts and 47 persons who for one reason or another wished to have a chest examination. Inasmuch as the records did not always present a complete family roster together with the physical findings on each member, it is not possible to draw direct conclusions regarding the completeness of family service. The ratio of 7 nontuberculous individuals to 4 diagnosed and suspected tuberculous cases, however, would indicate that chest examination was limited to a group well selected from the standpoint of their having tuberculosis. More than half, or 26, of the diagnosed cases attended the clinic for the first time during the study year, and only one of these had prior contact with the health department. This lack of previous contact may be explained to some extent by the unusually high percentage of minimal pulmonary cases among the clinic clientele.

TABLE 4.—*Distribution of clinic patients according to diagnoses*

Total individuals registered at clinic			241
Nontuberculous		154	
Bone or joint tuberculosis		2	
Pulmonary tuberculosis, suspected		42	
Pulmonary tuberculosis, diagnosed		43	
Tracheobronchial tuberculosis	10		
Minimal pulmonary	18		
Moderately advanced pulmonary	9		
Far advanced pulmonary	4		
Pulmonary unclassified as to type	2		

Every patient attending the clinic received a general physical examination. Only 63, all of whom were patients of the Brunswick County clinic, were checked by X-ray. This infrequent use of X-ray was due in part to the limited capacity of the mobile unit, and in part to the policy of referring residents of Greensville County to a local private laboratory. Limitations placed on the use of X-ray made it necessary for the State clinician to rely on physical examination for presumptive diagnosis and to reserve X-ray for confirmation in selected instances. This practice is the reverse of that used in many well-organized clinics where the preliminary screening out process is done by X-ray. In this manner the flow of patients through the clinic is accelerated, and the cost per diagnosed case is markedly decreased.

It would appear that the local clinic service for many patients was conducted independently of the field nursing program. For example, 174 of the 241 clinic patients were not seen in the field by a nurse within 6 months either before or after the first visit to the clinic; 132 were recorded as having had no nursing service at any time prior to or during the study period. However, it must be understood that the clinic was operated primarily as a diagnostic service to local physicians. The family physician was expected to assume responsibility for initiating whatever treatment procedures seemed indicated. Under these circumstances it may be expected that the nurses would be somewhat hesitant about establishing contact with the patient except on invitation of the family physician. Cooperation between the nurse and the family physician in relation to tuberculosis is described in other sections of this paper.

FIELD NURSING SERVICE

The local field nursing service in relation to tuberculosis is conducted primarily as a control measure, but the approach is essentially that of education. The several acts commonly involved in bringing persons to medical attention, especially for diagnosis, describe a large part of the nurse's effort. Bedside care, when given, is for purposes of demonstrating nursing techniques to some member of the family.

There is a record in the local health department to the effect that the nurses had some type of contact with 306 individuals in the interest of tuberculosis service. This number constitutes about 27 percent of all persons who received a home call for any purpose by the county health department nurses. Tuberculosis can therefore be construed as occupying an important place in the nursing program. The nursing service in common with other elements of the tuberculosis program reached its highest concentration in Brunswick County and among the white population of both counties.

By referring to table 3, it will be noted that the number of clients represented in the nursing service was as follows: Contacts 180, cases

66, suspects 31, and nontuberculous individuals 29. Roughly speaking, the nurses came in contact with about two-thirds of the cases and nearly three-fourths of the contacts encompassed by the health department program.

Nursing visits made to the group seen averaged 2.2, but over half of the individuals received only one visit. The mean number of visits to the positively diagnosed cases was 3.3 although one visit constituted the service extended to about 35 percent of the cases. Service to the contacts was less intensive than it was to cases; the average number of visits to contacts being 2.2, while slightly more than half of these individuals were seen only once during the study year.

As further evidence that the nursing service is not closely linked with the clinic, it may be stated that the nurses carried but 23 of the 49 clinic cases and only 39 of the 107 contacts who attended the clinic. There remained 43 cases and 141 contacts among the nurses' clientele who apparently had no medical supervision except that which may have been supplied by the private physician, but on the subject of private medical care the nurses' records are not clear.

Mention has already been made of the fact that the clinic operated primarily as a consultation service for private physicians. Another explanation for the lack of linkage that the records seem to show between the nursing service and the clinic may be found in the major purpose of many home visits by nurses; namely, that of locating individuals who should attend the clinic. Nurses reported having discussed clinic attendance with 227 individuals. Despite the emphasis placed on clinic attendance, their efforts could not have been very successful, since only 23 cases and 39 contacts who came to the clinic during the study year were the recipients of field nursing service. The nurses also reported having urged 79 persons to consult their personal physicians, but it was not possible from the records to appraise the nurses' efforts in this regard.

Another important purpose of nursing service was to give special instruction on personal hygiene and points mentioned by the clinician. The numbers of individuals with whom different subjects were discussed are as follows:

Subject:	Number of individuals
Health habits	183
Nutrition	69
Sanatorium care	28
Correction of physical defects	28

Assistance described as social service was rendered to 33 individuals. Bedside nursing care, for the purpose of demonstrating technique to some member of the family, was given to only four patients. Transportation, apparently to facilitate clinic attendance, was listed for 23 persons. Perhaps the most striking point in the

foregoing account of the service is the small amount of actual bedside nursing care that was given to a population where the need for it must have been great. The omission of bedside service reflected a policy that was laid down by the State health department. This policy, in turn, is an expression of the belief common among health administrators that a nursing staff, small in proportion to the population, is most effective when its activities are limited to educational measures.

In studying the nursing service from a family standpoint it was found that 79 families with a known or suspected case of tuberculosis in the household had contact of some type with a nurse of the health department. Exactly 58 of this number were visited for tuberculosis control. In only 14 instances did the nursing service include all members of the family. Also there were numerous instances where service to but one or perhaps a few members of large families appeared in the nursing records. Apparently the family did not, as a routine matter, constitute the unit for field nursing service in relation to tuberculosis control.

SURVEY OF CASES REPORTED TO STATE

According to the records of the tuberculosis bureau of the State health department, there were 165 cases with either positive or presumptive diagnosis of tuberculosis in Brunswick and Greensville Counties at the close of the study. Sixty-five of these cases were among the clientele of the local health department and 100 were not. A special survey was made of the latter group to determine the status of each individual. By interrogating either the person or some member of the family, sufficient information was elicited to classify the reported cases as follows:

Died	10
Moved away	10
Tuberculosis arrested	45
Tuberculosis active	9
Tuberculosis, childhood type	7
Tuberculosis of bone	1
Diagnosis questionable	18
Total	100

Of those who had died, 5 died before the beginning of the study year, 1 during the year, and the remaining 4 died in the interim between the close of the year and the visit of the worker. Certainly if the State register were an active one, the names of at least the first 6 cases should not have appeared on it. No information could be obtained locally about those persons who had moved away. Considerable doubt may be raised concerning the existence of tuberculosis in the 18 whose diagnosis was classed as questionable. None of them

admitted having been told that he actually had tuberculosis. Only two were manifestly ill at the time of the survey, but each person attributed his disability to a cause other than tuberculosis. Perhaps this entire group of 18, whose diagnosis appears not to have been established, should never have appeared on the list. When these cases are disregarded and all other reasonable deletions are made from the State list, those individuals that remain of the 100 originally under consideration represent a known tuberculosis problem of considerable magnitude which was not touched by the local program during the study year. It must not be inferred that all persons on the State list, but not registered with the local health department, were without some medical service. As a matter of fact 44 were examined by a private physician during the study year and 35 consulted one previously. Information regarding medical service could not be obtained on 10, thus leaving only 11 who definitely stated that they had not seen a physician in regard to tuberculosis.

APPRAISAL OF PROGRAM

Data compiled in connection with this study were assembled primarily to determine the distribution of services by a small county health department in relation to the tuberculosis problem of a rural area. On this point the study revealed that the health department established a relationship of some type with less than half the estimated number of cases and a much smaller proportion of the probable contacts. A large part of the program represents no more than a single service by either the clinic physician or the field nurse.

It must be remembered, however, that the main purpose of the program was to find individuals who might be tuberculous. Once a diagnosis had been established, the family physician was expected to assume major responsibility for directing the future care of those needing attention. Under the circumstances, it is not surprising that there should be so many clinic cases without nursing follow-up service. Very likely the clinic dealt directly with the family physician who, in many instances, had not sought assistance from the nurses. The seemingly high percentage of cases reported to have had nursing service only may be explained in part on the grounds that the nurses were not always careful about recording medical supervision by the family physician. More often the visit by the nurse is likely to represent an unsuccessful attempt to induce attendance at the chest clinic.

Without doubt the clinic served a very important need of the area. It would seem, however, that its limited resources could have been made available to a larger number of individuals if X-ray had been used freely to select those in need of a careful physical examination

and to check the changes in physical findings which might have occurred between visits to the clinic.

It does not seem probable that the program in Brunswick and Greensville Counties could have been very effective as a control measure. Not more than one-half of the estimated cases and perhaps less than 20 percent of contacts were touched in any way. Case-finding procedures were not sufficiently extensive and searching to locate a high proportion of infectious persons. Generally speaking, the local program provided very little, if any, actual care of patients. Those patients who were admitted to the sanatorium perhaps represent the only group that obtained the full effect of the tuberculosis service, but they constitute a very small percentage of the total number who might have been benefited. The outstanding defect in the program, of course, is its lack of intensity. Obviously, the fault rests with the citizens who failed to give adequate financial support to a health organization which in many respects functioned admirably within the limits of its resources.

SEASONAL PATTERNS AND TRENDS OF COMMUNICABLE DISEASES

By Robert Olesen, *Assistant Surgeon General*, and Brock C. Hampton, *Junior Administrative Assistant, United States Public Health Service*

The chronological incidence records left behind by some of the communicable diseases are as characteristic as finger or other prints and are as readily identified by experienced epidemiologists as the clinical entity itself is identified by the physician. This fact is well shown in the weekly records of communicable disease incidence kept by the Public Health Service over a period of years. Charts containing these records plotted by weeks furnish a graphic picture of the seasonal epidemiology of these common diseases. In the charts displayed in the present article weekly records of eight diseases are shown for each year from 1928 to 1936, inclusive. The weekly records during the year 1936 are shown by black dots. The seasonal characteristics and trends, when they are present, will be indicated in the following brief discussion of each disease.

Diphtheria.—The morbidity experience with diphtheria in 1936 was the most favorable ever recorded. Yet, even for that year the seasonal pattern and trend are clear-cut in their resemblance to previous years. The characteristic features of the graph for this disease are its gradual rise beginning in August, the plateau in October and November, the decline during December and the succeeding months, and the low incidence during May, June, July, and August. The very encouraging experience with diphtheria in 1936 inspires the hope that, with the

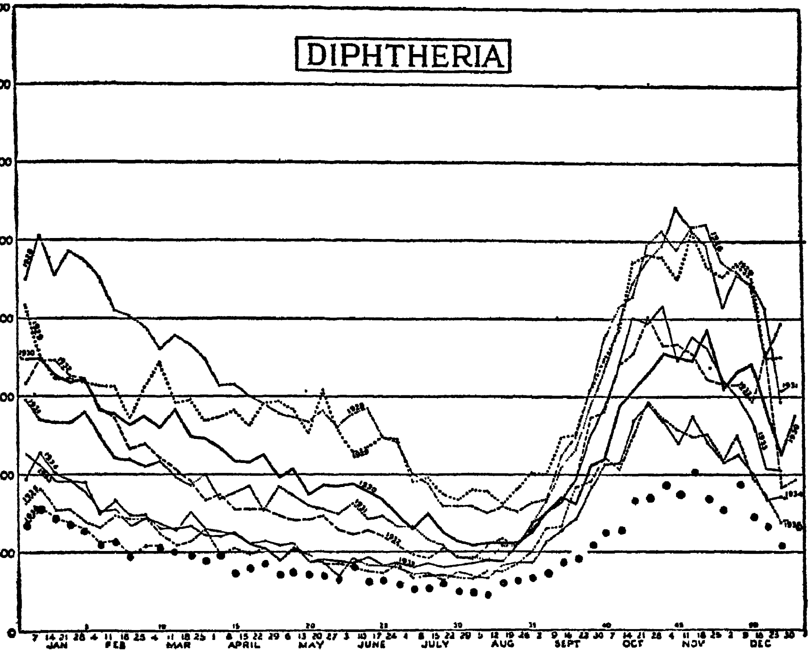
specific measures for prevention and control at hand, we may see this former scourge, still too prevalent, descend to even lower levels during the succeeding years.

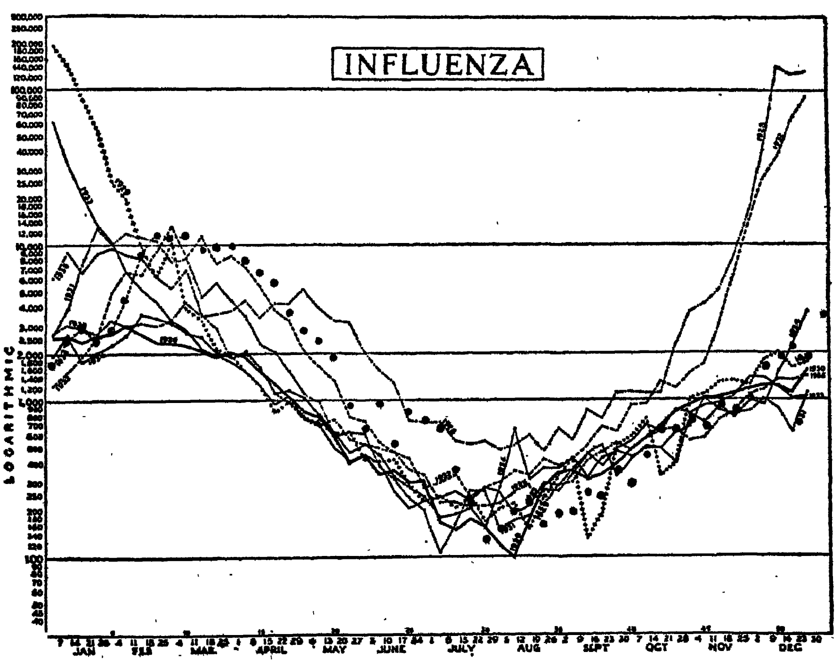
Influenza.—Although this disease sometimes departs from its conventional paths, as it did in 1928, 1932, and 1936, it maintains in general a recognizable seasonal pattern. Thus the incidence is usually highest, though gradually declining, during the first 6 months of the year. After its lowest incidence in July and August, there is ordinarily a gradual rise during the remaining months. However, in the minor epidemics of 1928 and 1932 the deviations from the normal curve began late in October and rose rapidly to reach their peaks in January and December, respectively. The considerable rise which occurred in 1937 and reached its peak late in January is seen in its initial departure late in December 1936.

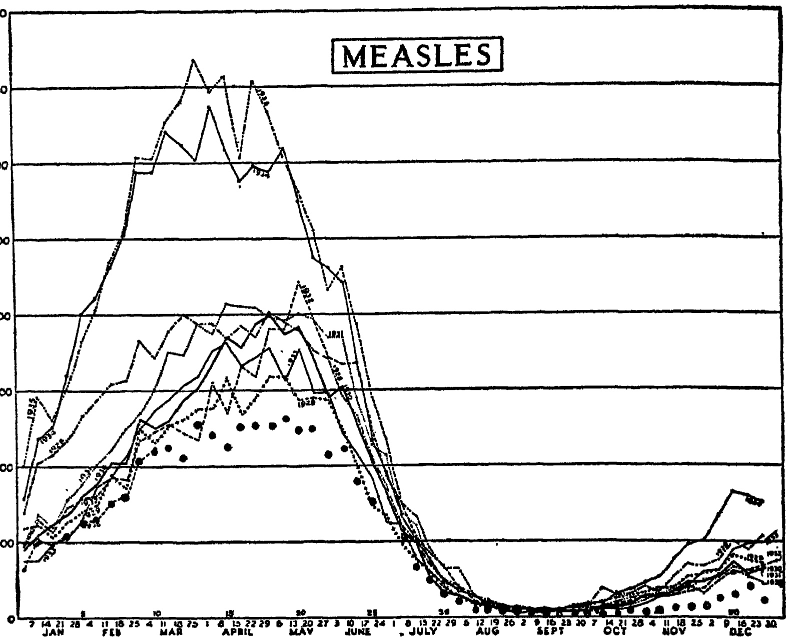
Measles.—In some cities and States the picture of measles is marked by alternating years of high and low prevalence. However, when Nation-wide incidence is considered, these local irregularities are more or less ironed out. The abrupt rise in measles incidence which is the beginning of the sharp upward curve customarily starts in January, achieves its height in March or April, and thereafter declines rapidly, reaching low points in August and September, to begin a slow, gradual rise for the remainder of the year. A consideration of the measles chart shows that both 1934 and 1935 were years with high measles incidence. It is also apparent that the experience with measles in 1936 was unusually favorable.

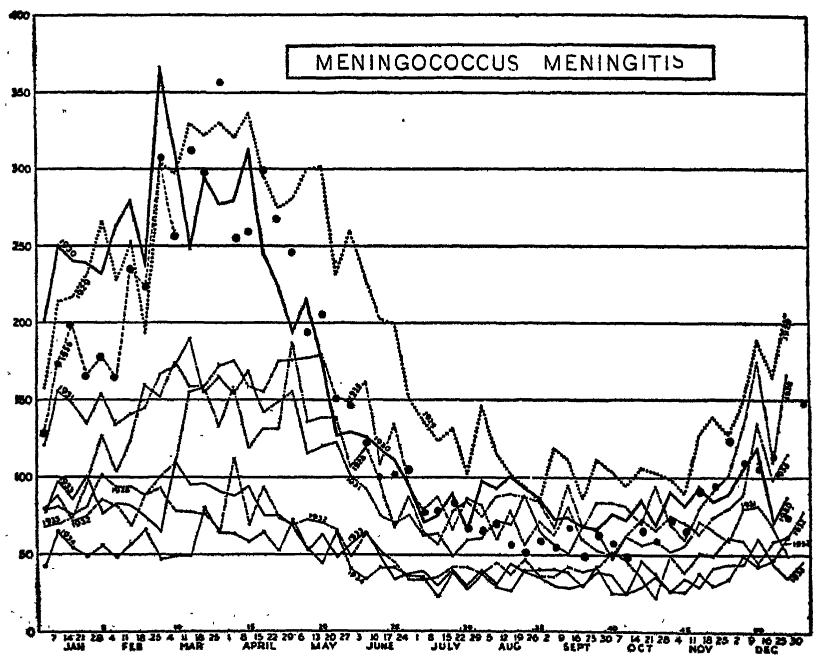
Meningococcus meningitis.—This disease, as shown by an experience covering 9 years, though somewhat erratic in its incidence, still follows a general seasonal pattern. With the possible exception that the disease is more frequent in the first 6 months of the year, it does not follow a closely confined, set incidence form, and its anticipated prevalence at a given time cannot be foretold with any degree of accuracy. In 1936 the incidence of this disease was distinctly less favorable than during previous years.

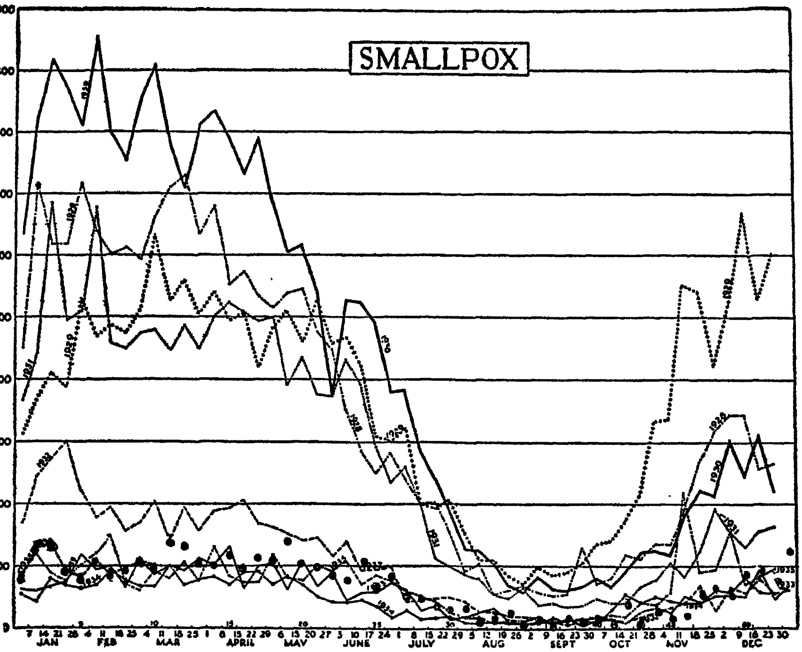
Poliomyelitis.—This is another disease which follows a rather stereotyped incidence curve. Prevailing with a rather low and uniform rate during the first 5 months of the year, the number of cases ordinarily increases in June. From this time on there is a steady though gradual rise in incidence until August, after which time there is a tendency to flatten out in a maintained and plateaulike curve which descends reluctantly late in October. Though much apprehension was aroused by the unusual prevalence of poliomyelitis in Alabama, Mississippi, Georgia, and Tennessee in 1936, it will be seen, upon examining the chart, that, for the country as a whole, a greater number of cases was reported during corresponding periods of several previous years.

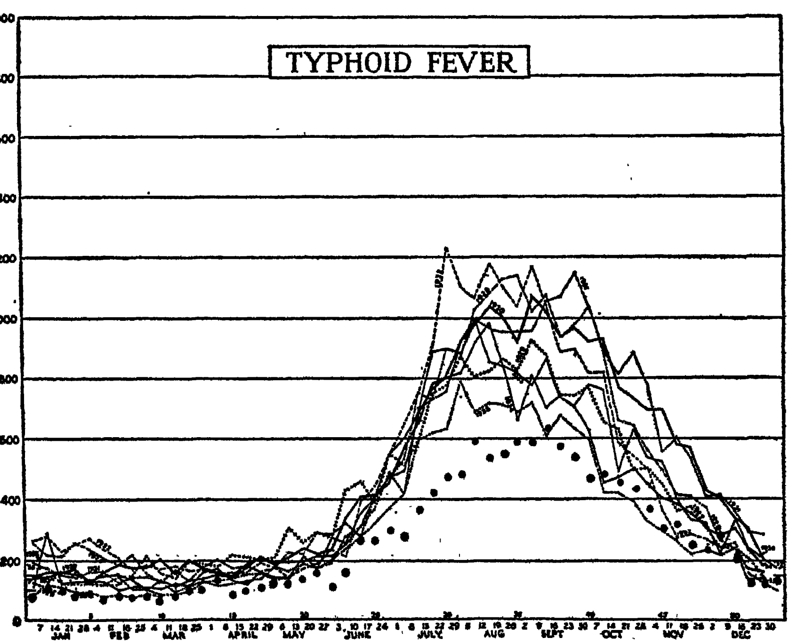

DIPHTHERIA
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

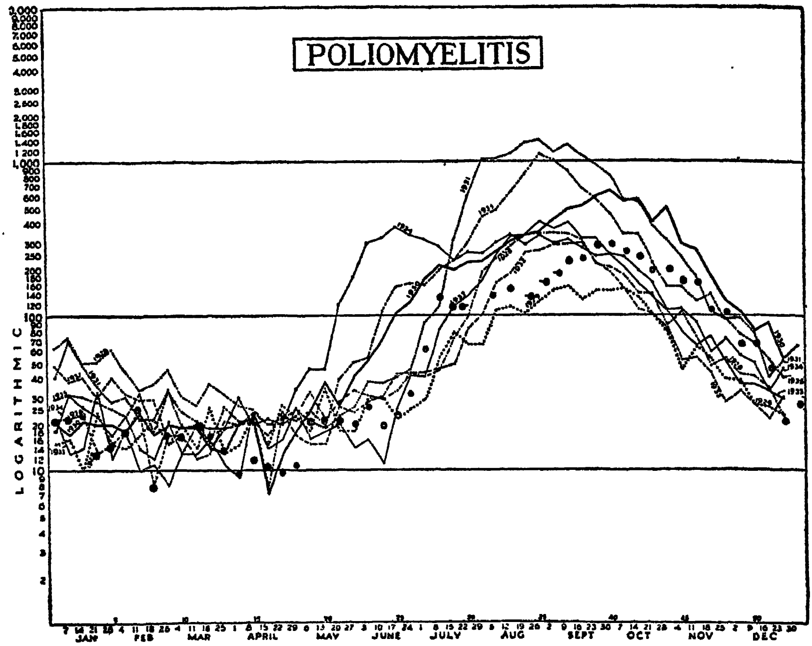

INFLUENZA
LOGARITHMIC
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

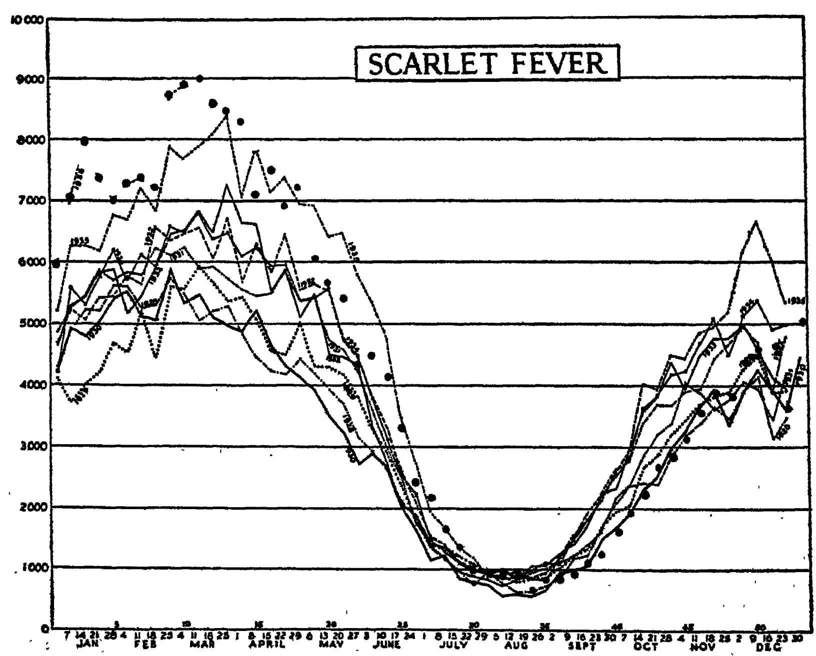

MEASLES
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC


MENINGOCOCCUS MENINGITIS
400
350
300
250
200
150
100
50
0
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC


SMALLPOX
2000
1800
1600
1400
1200
1000
800
600
400
200
0
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC


TYPHOID FEVER
2000
1800
1600
1400
1200
1000
800
600
400
200
0
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC


POLIOMYELITIS
LOGARITHMIC
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC


SCARLET FEVER
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

A point of interest in connection with the incidence of poliomyelitis is the similarity of its seasonal curve to that of typhoid fever. However, in the case of typhoid fever the gradual rise begins slightly earlier in the year, while with poliomyelitis the number of cases increases in June after an even incidence during the preceding months.

Scarlet fever.—Scarlet fever is another disease in which the incidence curve follows a clear-cut pattern. During the first 6 months of the year this affection is ordinarily quite prevalent, mostly so during March and April. Thereafter the morbidity rate gradually declines, reaching its lowest points in July and August. However, coincident with the beginning of school there is a steady increase in the number of cases most marked during the last 3 months of the year, usually continuing to the heights previously noted during the first half of the year.

The experience with scarlet fever during 1936 was unfavorable during the first 6 months but more favorable during the latter part of the year as compared with previous records.

Smallpox.—The chart shows that smallpox is another disease which has an erratic trend, though obviously more prevalent during the first half of the year. This fact is well shown by the morbidity reported during the 4 years beginning with 1928, when smallpox prevailed to a considerable extent. In 1932 and thereafter the recorded cases of this disease were comparatively fewer and, while still more frequent during the first 6 months of each year, quite uniform in prevalence. The year 1936, like the 4 preceding years, showed a favorable low incidence, with indication of the prospect of an increased prevalence, however, manifested in the last week of December.

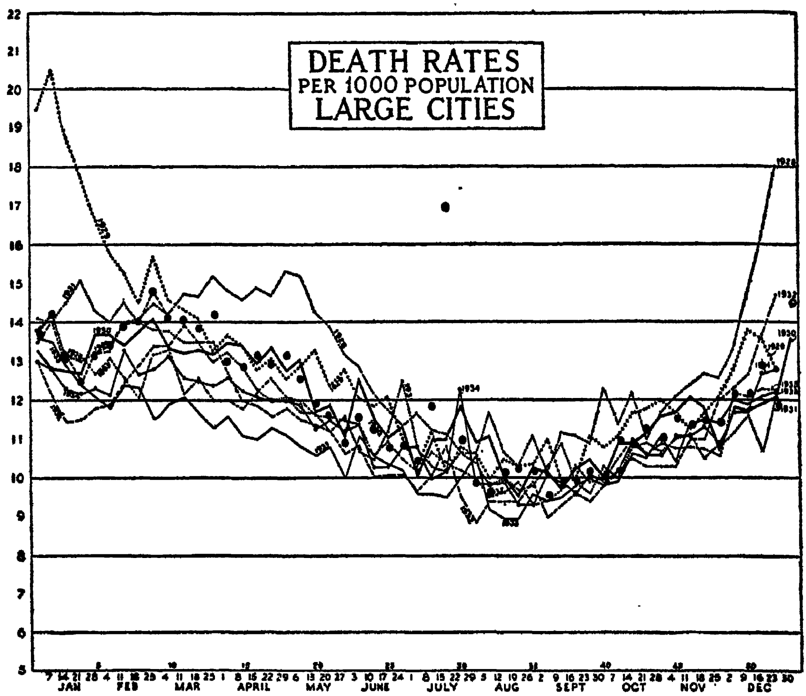
Typhoid fever.—An unusually low typhoid fever incidence was recorded in 1936, in fact the lowest of the 9 years shown in the chart. Yet, even so, the 1936 curve of incidence followed an easily recognizable pattern characteristic of the weekly reports of the disease. Typhoid fever is least prevalent during the first 5 months of the year, then rises gradually and reaches a plateau of incidence which lasts from July to October, after which there is a gradual decline.

Death rates in large cities.—Another current chart maintained by the Public Health Service may be shown in this connection. This is a record of death rates from all causes per 1,000 population in 86 large cities of the United States, the data for which are obtained from weekly telegraphic reports. Here again a general seasonal pattern may be discerned, although it is not as clearly marked as in some of the morbidity charts. However, the higher death rates in the first 6 months, beginning definitely in November or December, are clearly shown. The expected low rates during the summer months and the gradual rise thereafter are also quite plain. The unfavorable experience in

the summers of 1930, 1931, 1934, and 1936 during the extreme heat which prevailed in July in 1930, 1934, and 1936 and in June in 1931, is shown by the greatly heightened death rate curves. The chart shows very clearly that the death rates are not only lowest in summer but are the least variable at that season.

SUMMARY

By plotting weekly morbidity reports over a period of years it is possible to determine the seasonal prevalence picture and the trends



of several communicable diseases, notably, diphtheria, measles, scarlet fever, influenza, and poliomyelitis and, to a less extent, meningococcus meningitis and smallpox. The same information can be obtained through the use of median endemic indexes, thereby eliminating many confusing curves converging and falling for a period in close proximity.

Patterns and trends such as those indicated, while not susceptible of use in accurate forecasting, may be helpful as an index to expectancies and serve a useful purpose in warning health workers of needed action.

DEATHS DURING WEEK ENDED APRIL 17, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 17, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	9,122	9,422
Average for 3 prior years	8,840	
Total deaths, first 15 weeks of year	151,360	146,318
Deaths under 1 year of age	594	556
Average for 3 prior years	610	
Deaths under 1 year of age, first 15 weeks of year	9,371	8,817
Data from industrial insurance companies:		
Policies in force	69,693,853	68,409,589
Number of death claims	14,545	13,836
Death claims per 1,000 policies in force, annual rate	10.9	10.6
Death claims per 1,000 policies, first 15 weeks of year, annual rate	11.5	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 24, 1937, and Apr. 25, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936
New England States:								
Maine	2		1	69	21	72	0	1
New Hampshire					26	44	0	0
Vermont					1	496	0	0
Massachusetts	2	6			621	1,400	5	4
Rhode Island					194	72	1	1
Connecticut	4	1	4	4	632	109	3	1
Middle Atlantic States:								
New York	62	49	[1] 10	[1] 15	1,152	3,454	8	22
New Jersey	17	15	7	19	2,082	360	2	15
Pennsylvania	38	34			1,112	1,014	8	9
East North Central States:								
Ohio	6	17	23	36	1,041	209	1	11
Indiana	5	5	13	76	400	21	1	3
Illinois	35	35	64	66	188	30	5	22
Michigan	20	1	1	6	138	102	3	3
Wisconsin	4	1	52	40	34	81	2	5
West North Central States:								
Minnesota	1				23	382	1	0
Iowa	4	7	51	7	12	1	0	1
Missouri	21	17	92	465	56	32	6	4
North Dakota	4		27	7	2		1	0
South Dakota						5	0	0
Nebraska	1	10			18	13	4	1
Kansas	2	11	4	47	47	16	0	1
South Atlantic States:								
Delaware	1				67	17	1	0
Maryland [2]	14	6	11	11	606	330	4	18
District of Columbia	2	13	1	2	107	121	2	4
Virginia	9	12		235	617	112	7	11
West Virginia	7	9	33	90	108	76	4	13
North Carolina [3]	12	20	30	28	133	44	13	2
South Carolina	5	3	388	264	64	44	1	2
Georgia [3]	3	9	131	170			1	3
Florida	1	6		31		18	14	5
East South Central States:								
Kentucky	2	9	15	278	375	310	28	62
Tennessee	10	12	48	395	36	90	4	7
Alabama [3]	9	18	151	333	35	5	18	3
Mississippi [2]	5	5					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 24, 1937, and Apr. 25, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936
West South Central States:								
Arkansas	1	10	107	352	1	--------	1	2
Louisiana	15	8	18	99	8	49	5	0
Oklahoma [4]	12	8	108	490	77	22	1	5
Texas [3]	46	43	564	481	811	246	4	9
Mountain States:								
Montana	--------	3	6	21	19	17	1	2
Idaho [5]	--------	1	10	--------	71	63	0	0
Wyoming	--------	--------	--------	1	11	3	0	1
Colorado	7	4	--------	--------	6	38	1	0
New Mexico	5	2	2	6	134	42	1	1
Arizona	3	2	29	119	165	134	0	2
Utah [2]	--------	1	--------	--------	24	16	0	0
Pacific States:								
Washington	--------	--------	--------	2	52	327	0	0
Oregon [5]	--------	3	18	59	10	225	2	0
California	50	26	98	74	293	2,841	5	10
Total	447	442	2,117	4,398	11,630	13,103	169	267
First 16 weeks of year	8,084	9,059	264,910	124,872	115,783	151,488	2,709	3,946

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936
New England States:								
Maine	0	0	26	9	0	0	1	0
New Hampshire	0	0	6	7	0	0	0	2
Vermont	0	0	9	7	0	0	0	1
Massachusetts	0	0	245	252	0	0	9	0
Rhode Island	0	0	46	33	0	0	1	0
Connecticut	0	0	163	57	0	0	0	3
Middle Atlantic States:								
New York	0	0	1,026	834	0	0	5	9
New Jersey	0	0	205	354	0	0	4	3
Pennsylvania	0	2	589	539	0	0	7	21
East North Central States:								
Ohio	0	1	229	281	0	0	6	10
Indiana	0	0	160	219	19	0	1	0
Illinois	0	0	814	823	55	3	3	4
Michigan	0	0	816	252	1	1	2	3
Wisconsin	1	0	305	507	4	5	2	1
West North Central States:								
Minnesota	0	0	158	307	22	5	0	0
Iowa	1	0	271	254	34	40	2	0
Missouri	0	0	405	253	74	15	3	1
North Dakota	0	0	32	45	58	12	1	1
South Dakota	0	0	59	49	7	28	0	0
Nebraska	1	0	195	122	12	22	0	0
Kansas	0	0	289	468	20	23	0	0
South Atlantic States:								
Delaware	0	0	6	3	0	0	0	0
Maryland [2]	0	0	58	76	0	0	4	0
District of Columbia	0	0	18	18	0	0	1	0
Virginia	0	0	8	68	0	0	1	5
West Virginia	2	1	59	41	1	0	1	3
North Carolina [3]	0	1	41	28	1	0	2	1
South Carolina	0	0	1	2	0	0	1	1
Georgia [3]	0	0	6	10	0	0	3	3
Florida	0	0	42	5	0	0	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 24, 1937, and Apr. 25, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936	Week ended Apr. 24, 1937	Week ended Apr. 25, 1936
East South Central States:								
Kentucky	0	0	60	47	0	0	4	4
Tennessee	0	0	30	27	0	0	1	2
Alabama [3]	0	1	10	5	1	0	0	4
Mississippi [2]	3	0	1	2	0	0	0	0
West South Central States:								
Arkansas	0	1	13	8	5	1	3	1
Louisiana	0	0	13	5	0	1	6	1
Oklahoma [4]	0	0	41	52	3	0	11	4
Texas [3]	5	0	123	39	7	0	7	4
Mountain States:								
Montana	0	0	25	99	14	7	2	0
Idaho [5]	0	0	27	48	3	1	0	0
Wyoming	0	0	5	34	2	6	0	0
Colorado	0	0	40	102	9	0	1	0
New Mexico	1	0	44	59	0	0	3	3
Arizona	2	0	19	28	0	0	0	0
Utah [2]	0	0	22	66	0	2	0	0
Pacific States:								
Washington	1	0	26	90	14	10	1	2
Oregon [5]	0	0	30	37	19	53	0	4
California	2	3	202	311	14	0	6	14
Total	19	10	7,018	6,982	399	235	107	117
First 16 weeks of year	355	259	110,251	125,198	5,097	3,558	1,751	1,697

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 24, 1937, 28 cases, as follows: North Carolina, 2; Georgia, 13; Alabama, 5; Texas, 8.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 24, 1937, 6 cases, as follows: Idaho, 3; Oregon, 3.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1937										
Alabama	55	48	7,731	82	69	15	4	58	0	8
Georgia	9	40	4,154	278	54	29	2	86	1	7
Illinois	26	179	431	9	268	1	9	3,705	141	19
Indiana	12	50	357		172		2	1,016	17	3
Iowa	4	15	45	1	12		4	1,585	150	3
Kansas	8	40	226	1	68		0	1,762	165	3
Louisiana	23	73	785	39	205	3	1	42	11	37
Maine	5	5	328		84		0	94	0	3
Missouri	14	89	1,212	13	70		0	1,907	355	18
New York	53	153		4	3,092		2	4,582	5	26
North Dakota	1	5	3		6		0	174	29	0
Oklahoma [1]	30	34	913	15	115	7	1	118	13	12
Oregon	3	1	191	1	29		2	108	119	5
South Dakota	5		25		12		0	325	7	2
Texas	41	171	8,697	1,060	1,957	76	9	433	14	48
Washington	12	10	46		167		1	145	48	10

[1] Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

March 1937

	Cases
Anthrax:	
New York	2
Botulism:	
Oregon	1
Chicken pox:	
Alabama	180
Georgia	163
Illinois	1,917
Indiana	446
Iowa	285
Kansas	663
Louisiana	70
Maine	284
Missouri	393
New York	4,003
North Dakota	43
Oklahoma [1]	33
Oregon	128
South Dakota	46
Texas	928
Washington	914
Conjunctivitis:	
Georgia	8
Oklahoma [1]	1
Dengue:	
Texas	19
Dysentery:	
Georgia (amoebic)	29
Georgia (bacillary)	2
Illinois (amoebic)	6
Illinois (amoebic carriers)	7
Illinois (bacillary)	11
Iowa (bacillary)	1
Kansas (amoebic)	3
Kansas (bacillary)	1
Louisiana (amoebic)	13
Maine	1
New York (amoebic)	6
New York (bacillary)	49
Oklahoma [1]	4
Oregon (amoebic)	1
Texas (bacillary)	10
Washington (bacillary)	1
Encephalitis, epidemic or lethargic:	
Alabama	2
Georgia	1
Illinois	4
Indiana	1
Kansas	2
New York	10
Oklahoma [1]	1
South Dakota	1
Texas	5
Washington	1
Favus:	
Georgia	1
German measles:	
Alabama	1
Illinois	54
Kansas	16
Maine	16
New York	189
Washington	43
Hookworm disease:	
Georgia	2,300
Louisiana	12

March 1937—Continued

	Cases
Impetigo contagiosa:	
Kansas	2
Oregon	38
Washington	3
Jaundice, infectious:	
Oregon	6
Lead poisoning:	
Illinois	2
Mumps:	
Alabama	210
Georgia	285
Illinois	803
Indiana	222
Iowa	154
Kansas	1,312
Louisiana	38
Maine	371
Missouri	148
North Dakota	6
Oklahoma [1]	14
Oregon	96
South Dakota	5
Texas	1,514
Washington	607
Ophthalmia neonatorum:	
Alabama	2
Illinois	8
Kansas	1
Louisiana	1
New York [2]	8
Paratyphoid fever:	
Georgia	1
Illinois	4
New York	5
Texas	1
Washington	3
Puerperal septicemia:	
Georgia	2
Illinois	1
Rabies in animals:	
Alabama	99
Illinois	36
Indiana	48
Louisiana	37
Maine	1
Missouri	2
New York [2]	6
Oregon	4
Texas	6
Washington	21
Rocky Mountain spotted fever:	
Oregon	3
Scabies:	
Kansas	13
Oregon	52
Septic sore throat:	
Georgia	51
Illinois	14
Kansas	17
Louisiana	7
Missouri	47
New York	82
Oklahoma [1]	36
Oregon	14
South Dakota	2
Washington	3

March 1937—Continued

	Cases
Tetanus:	
Georgia	1
Illinois	2
Louisiana	3
New York	1
Trachoma:	
Alabama	1
Illinois	2
Missouri	10
Oklahoma [1]	9
Oregon	3
Washington	14
Trichinosis:	
Illinois	1
New York	22
Tularaemia:	
Alabama	5
Georgia	12
Illinois	9
Louisiana	7
Missouri	2
Texas	5
Typhus fever:	
Alabama	12
Georgia	41
New York	1
Texas	21
Undulant fever:	
Alabama	1
Georgia	4
Illinois	4
Indiana	1
Iowa	12
Kansas	2
Louisiana	1
Maine	2
Missouri	3
New York	10
Oklahoma [1]	5
Texas	7
Washington	2
Vincent's infection:	
Illinois	52
Kansas	1
Maine	5
Missouri	136
New York [2]	74
North Dakota	1
Oklahoma [1]	2
Oregon	2
Washington	1
Whooping cough:	
Alabama	153
Georgia	94
Illinois	862
Indiana	283
Iowa	211
Kansas	232
Louisiana	40
Maine	186
Missouri	663
New York	1,721
North Dakota	14
Oklahoma [1]	26
Oregon	123
South Dakota	3
Texas	737
Washington	275

[1] Exclusive of Oklahoma City and Tulsa.
[2] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 17, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	219	313	93	7,773	812	2,509	24	436	26	1,522	-------
Current week	153	128	69	3,709	855	2,729	41	383	23	1,533	-------
Maine:											
Portland	0	------	0	0	2	5	0	0	0	6	35
New Hampshire:											
Concord	0	------	0	0	2	1	0	0	0	0	14
Manchester	0	------	1	9	1	4	0	0	0	0	28
Nashua	0	------	0	2	1	1	0	0	0	1	5
Vermont:											
Barre	0	------	0	0	0	3	0	0	0	3	1
Rutland	0	------	0	0	0	0	0	0	0	0	6
Massachusetts:											
Boston	0	------	2	32	23	73	0	12	0	58	259
Fall River	0	------	1	18	1	1	0	0	0	5	30
Springfield	0	------	0	3	3	5	0	0	0	15	42
Worcester	0	------	0	86	7	7	0	0	0	19	66
Rhode Island:											
Pawtucket	0	------	0	4	0	3	0	0	0	2	17
Providence	2	------	0	171	4	41	0	4	0	15	74
Connecticut:											
Bridgeport	0	------	0	14	2	51	0	0	0	0	34
Hartford	0	------	0	2	3	11	0	1	0	5	43
New Haven	0	------	0	1	5	11	0	2	0	8	54
New York:											
Buffalo	1	------	1	114	14	14	0	8	0	27	125
New York	40	23	6	459	138	485	0	82	3	75	1,668
Rochester	0	------	0	2	7	6	0	1	0	7	64
Syracuse	0	------	1	13	4	33	0	2	0	26	62
New Jersey:											
Camden	2	1	1	1	5	6	0	2	0	13	47
Newark	0	2	0	616	14	34	0	5	0	22	91
Trenton	0	------	1	1	4	8	0	1	0	0	41
Pennsylvania:											
Philadelphia	4	6	5	36	48	271	0	28	0	66	521
Pittsburgh	3	6	3	69	34	49	0	4	1	11	198
Reading	0	------	0	313	2	23	0	2	0	10	33
Scranton	1	------	--------	0	-------	16	0	-------	0	1	-------
Ohio:											
Cincinnati	3	------	1	212	18	17	0	2	0	9	137
Cleveland	2	6	2	157	31	82	0	10	0	47	210
Columbus	1	------	0	10	3	17	0	3	0	16	79
Toledo	0	2	2	152	6	4	0	4	0	45	84
Indiana:											
Anderson	0	------	0	1	2	13	0	0	0	0	10
Fort Wayne	1	------	0	0	0	5	0	0	0	0	27
Indianapolis	3	------	2	128	16	33	1	1	0	36	124
Muncie	0	------	0	0	0	4	0	1	0	2	11
South Bend	0	------	0	1	2	4	0	0	0	7	22
Terre Haute	3	------	0	1	0	0	1	0	0	0	24
Illinois:											
Alton	0	------	0	0	0	11	0	1	0	0	11
Chicago	6	9	3	73	63	328	0	39	0	70	748
Elgin	2	------	0	0	2	2	0	2	0	6	11
Moline	0	------	0	3	2	2	0	0	0	2	11
Springfield	0	------	0	0	1	8	0	1	0	8	28
Michigan:											
Detroit	7	------	4	12	45	382	0	19	1	82	289
Flint	1	------	0	0	10	23	0	2	0	7	31
Grand Rapids	0	------	1	48	2	11	0	0	1	30	39
Wisconsin:											
Kenosha	1	------	0	1	2	6	0	0	0	2	6
Madison	0	------	0	0	1	15	0	1	0	4	28
Milwaukee	0	2	2	5	13	66	0	4	0	18	121
Racine	0	------	0	1	0	13	0	1	0	1	15
Superior	0	------	0	0	1	6	0	0	0	4	9
Minnesota:											
Duluth	0	------	0	2	3	21	0	4	0	3	29
Minneapolis	4	------	6	1	9	19	0	3	0	54	91
St. Paul	0	2	2	2	4	13	0	2	0	152	57

City reports for week ended Apr. 17, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids	0			0		2	0		0	0	
Davenport	0			0		1	0		0	0	
Des Moines	0			1		42	0		0	1	44
Sioux City	0		0	0	0	17	0	0	0	1	
Waterloo	1			0		12	0		1	12	
Missouri:											
Kansas City	0		1	2	12	107	1	3	0	25	109
St. Joseph	0		0	0	7	23	22	0	0	0	25
St. Louis	12	1	3	2	15	153	1	4	3	93	230
North Dakota:											
Fargo	0		0	0	1	2	10	0	0	0	17
Grand Forks	0			0		0	0		0	5	
Minot	1		0	1	0	0	1	0	0	0	5
South Dakota:											
Aberdeen	0			0		1	0		0	0	
Sioux Falls	0		0	0	0	0	0	0	0	0	8
Nebraska: Omaha	0		0	0	5	8	3	0	1	11	46
Kansas:											
Lawrence	0		0	0	0	1	0	0	0	0	14
Topeka	1		0	0	0	11	0	0	0	10	16
Wichita	0		0	29	1	9	4	1	0	26	34
Delaware:											
Wilmington	2		0	3	4	6	0	0	0	0	34
Maryland:											
Baltimore	6	6	3	576	30	30	0	15	0	72	237
Cumberland	0		0	0	1	1	0	0	0	0	11
Frederick	0		0	7	0	1	0	1	0	0	5
District of Columbia:											
Washington	4		1	94	14	21	0	12	2	11	175
Virginia:											
Lynchburg	1		1	4	3	0	0	0	0	12	22
Norfolk	0		0	0	5	3	0	1	0	7	25
Richmond	2		1	0	5	5	0	2	1	3	65
Roanoke	0		0	199	3	0	0	2	0	0	18
West Virginia:											
Charleston	0		0	0	5	6	0	1	0	2	24
Huntington	1			1		5	0		0	0	
Wheeling	0		0	4	5	1	0	0	0	11	19
North Carolina:											
Gastonia	0		0	0	0	0	0	0	0	0	
Raleigh	0		0	2	3	1	0	0	0	0	18
Wilmington	0		0	2	5	0	0	0	0	0	13
Winston-Salem	1		0	1	4	2	0	0	0	0	15
South Carolina:											
Charleston	1	10	0	0	4	1	0	1	0	0	25
Florence	0		0	0	1	0	0	0	0	0	5
Greenville	1		0	0	0	0	0	0	0	0	10
Georgia:											
Atlanta	1	22	1	1	5	3	0	2	1	2	62
Brunswick	0		0	0	1	0	0	0	0	2	5
Savannah	1	11	1	0	6	2	0	3	0	0	33
Florida:											
Miami	0	6	0	3	2	2	0	2	3	0	39
Tampa	0	1	1	0	2	0	0	0	1	1	25
Kentucky:											
Ashland	0	1	1	33	8	0	0	1	0	0	21
Covington	0	1	0	14	1	1	0	1	1	0	14
Lexington	0		0	6	2	2	0	2	0	10	22
Louisville	0	11	0	19	13	19	0	2	0	36	99
Tennessee:											
Knoxville	0		3	0	2	0	0	0	2	0	21
Memphis	2		1	4	14	4	0	11	0	27	107
Nashville	0		0	0	9	4	0	0	0	7	56
Alabama:											
Birmingham	1	7	1	5	9	1	0	1	0	4	68
Mobile	0	1	0	0	6	0	0	0	0	2	31
Montgomery	0	4		0		0	0		0	2	
Arkansas:											
Fort Smith	0			0		0	0		0	3	
Little Rock	0		0	0	7	5	0	4	0	0	12
Louisiana:											
Lake Charles	0		0	0	1	0	0	0	1	0	4
New Orleans	6	1	6	2	18	9	0	11	4	1	156
Shreveport	2		0	0	7	0	0	0	0	2	51
Oklahoma:											
Muskogee	1			0		0	0		0	0	
Oklahoma City	0		0	12	12	8	1	1	0	0	39
Tulsa	0			3		9	0		0	3	

City reports for week ended Apr. 17, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Texas:											
Dallas	0	2	1	70	8	10	0	4	0	15	61
Fort Worth	0	------	1	20	8	12	0	3	0	3	56
Galveston	0	------	0	0	4	1	0	0	0	0	18
Houston	9	------	0	0	17	5	0	3	0	4	87
San Antonio	3	------	1	10	5	0	0	11	1	0	55
Montana:											
Billings	1	------	0	2	1	3	0	0	0	0	11
Great Falls	0	------	0	0	1	0	0	0	0	2	5
Helena	0	------	0	0	0	8	0	0	0	0	5
Missoula	0	------	0	0	2	0	0	0	0	0	8
Idaho:											
Boise	0	------	0	0	0	1	0	0	0	0	7
Colorado:											
Colorado Springs	0	------	0	1	3	9	1	2	0	0	14
Denver	6	------	0	3	10	19	1	5	0	47	85
Pueblo	0	1	0	0	0	0	0	0	0	6	6
New Mexico:											
Albuquerque	0	------	0	6	1	5	0	1	0	9	7
Utah:											
Salt Lake City	0	------	0	22	2	9	0	1	0	17	31
Washington:											
Seattle	0	------	1	2	6	3	1	9	0	22	129
Spokane	0	1	1	6	2	5	0	1	0	5	29
Tacoma	0	------	0	0	5	1	0	0	0	0	28
Oregon:											
Portland	0	------	1	3	4	11	6	0	0	5	83
Salem	0	1	------	0	------	1	0	------	0	1	------
California:											
Los Angeles	5	5	0	19	22	26	5	21	2	117	334
Sacramento	1	------	0	31	6	6	0	2	0	0	35
San Francisco	1	1	0	2	8	24	0	7	1	37	188

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	1	0
Massachusetts:			
Boston	7	0	0
Springfield	1	1	0
Rhode Island:			
Providence	1	1	0
New York:			
New York	7	5	2
Rochester	0	0	1
Pennsylvania:			
Pittsburgh	1	1	0
Ohio:			
Cincinnati	5	3	0
Cleveland	2	1	0
Indiana:			
Indianapolis	1	0	0
Muncie	0	1	0
Illinois:			
Alton	0	1	0
Chicago	3	1	1
Michigan:			
Detroit	2	0	0
Wisconsin:			
Milwaukee	1	0	0
Minnesota:			
Minneapolis	0	1	0
Missouri:			
St. Joseph	1	0	0
Delaware:			
Wilmington	0	1	0
Maryland:			
Baltimore	3	1	0
District of Columbia:			
Washington	3	2	1
Virginia:			
Richmond	0	2	0
North Carolina:			
Wilmington	3	1	0
South Carolina:			
Charleston	0	0	1
Georgia:			
Savannah	1	0	0
Florida:			
Miami	4	2	0
Tampa	1	0	0
Kentucky:			
Louisville	1	1	0
Tennessee:			
Memphis	2	1	0
Alabama:			
Birmingham	4	3	0
Mobile	0	1	0
Arkansas:			
Little Rock	0	1	0
Louisiana:			
Lake Charles	1	0	0
New Orleans	1	0	0
Shreveport	1	0	0
Oklahoma:			
Oklahoma City	1	0	0
Tulsa	1	0	0
Texas:			
Fort Worth	0	0	1
Houston	1	0	0
San Antonio	0	0	2
California:			
Los Angeles	0	1	1
San Francisco	0	1	0

Encephalitis, epidemic or lethargic.—Cases: Providence, 1; New York, 7; Mobile, 1.

Pellagra.—Cases: Baltimore, 1; Winston-Salem, 1; Charleston, S. C. 1; Savannah, 5; Birmingham, 1; New Orleans, 1; Los Angeles, 2.

Typhus fever.—Cases: Wilmington, N. C., 1; Montgomery, 1.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—4 weeks ended April 10, 1937.—During the 4 weeks ended April 10, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	29	1	Scarlet fever	5	
Malaria	[1] 38	2	Tuberculosis	14	2
Poliomyelitis	[1] 6		Typhoid fever	[1] 39	8

[1] Includes imported cases.

CZECHOSLOVAKIA

Communicable diseases—February 1937.—During the month of February 1937, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	1		Paratyphoid fever	6	1
Cerebrospinal meningitis	13	4	Poliomyelitis	2	
Chicken pox	258		Puerperal fever	35	16
Diphtheria	1,691	125	Scarlet fever	1,431	26
Dysentery	25	1	Trachoma	56	
Influenza	7,758	68	Typhoid fever	299	31
Malaria	9		Typhus fever	12	

JAMAICA

Communicable diseases—4 weeks ended April 17, 1937.—During the 4 weeks ended April 17, 1937, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	5	31	Puerperal fever		3
Diphtheria		2	Scarlet fever	1	1
Dysentery	8	3	Tuberculosis	29	105
Erysipelas		1	Typhoid fever	8	61
Leprosy		2			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 30, 1937, pp. 571-585. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 28, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Philippine Islands—Manila.—On April 23, 1937, 1 fatal case of cholera was reported in Manila, Philippine Islands.

Plague

Dutch East Indies—Java—Batavia.—During the week ended April 10, 1937, 1 imported case of plague was reported in Batavia, Java, Dutch East Indies.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—Two rats found on April 22, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been found plague-infected.

Malta—Rabat.—A report dated April 20, 1937, states that 1 case of plague was reported in Rabat, Malta, about 5 miles from the port of Valletta.

Smallpox

Mexico.—During the month of January 1937, smallpox was reported in Mexico as follows: Aguascalientes, Aguascalientes State, 1 case; Ciudad Juarez, Chihuahua State, 9 cases; Coahuila State, 1 case; Guadalajara, Jalisco State, 1 case; Mexico, D. F., 12 cases, 5 deaths; Morelos State, 4 cases; Nayarit State, 1 case; Puebla, Puebla State, 1 case; San Luis Potosi, San Luis Potosi State, 1 case; Tamaulipas State, 8 cases.

Typhus Fever

Mexico.—During the month of January 1937, typhus fever was reported in Mexico as follows: Aguascalientes, Aguascalientes State, 2 cases, 1 death; Toluca, Mexico State, 8 cases, 1 death; Mexico, D. F., 14 cases, 6 deaths; Puebla, Puebla State, 7 cases; Queretaro, Queretaro State, 1 case; San Luis Potosi, San Luis Potosi State, 7 cases, 1 death.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Tres Lagoas, Matto Grosso State, 1 death, Mar. 16. Minas Geraes State—Campos Geraes, 1 death, Mar. 4; Conceicao da Apparecida (first appearance) 1 death, Mar. 3.

French Equatorial Africa—Brazzaville.—On April 19, 1937, 1 death from suspected yellow fever was reported in Brazzaville, French Equatorial Africa.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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BY THE UNITED STATES PUBLIC HEALTH SERVICE

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29, of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

VOL. 52 MAY 14, 1937 NO. 20

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

March 28–April 24, 1937

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—The influenza outbreak of the winter had abated in all regions, although the number of cases (14,019) reported for the current period was about double the number reported for this period in each of the years 1933–35, inclusive. The East North Central, South Central, and Pacific regions still showed signs of an excess as compared with more nearly normal preceding years, but in other regions the incidence was about normal. The outbreak of 1935–36 that started in the West, spread into the South Central and South Atlantic regions, and then into the North Central regions, reached its peak during March of 1936 and was on a decline during April, but approximately 32,000 cases were reported for the 4-week period corresponding to that under report.

Smallpox.—The incidence of smallpox remained at a relatively high level during the 4 weeks ending April 24, with 1,443 cases reported as compared with 878, 739, and 656 for the corresponding period in 1936, 1935, and 1934, respectively. The high incidence of this disease that has prevailed since the beginning of 1935 has been mostly confined to the Mountain, Pacific, and West North Central regions, but reports for the current period show also a considerable increase in the East North Central region. States reporting a relatively high incidence were as follows: Missouri, 303 cases; Illinois, 205 cases; Iowa, 114 cases; Kansas, 113 cases; and Michigan, 44 cases. In the Mountain and Pacific regions, Montana, Oregon, and Colorado reported most of the excess number of cases which has maintained the high incidence.

[1] From Statistical Investigations, Division of Public Health Methods, National Institute of Health. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 46; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

Meningococcus meningitis.—The reported incidence of meningococcus meningitis (690 cases) was about 60 percent of that for the corresponding period in 1936, but it was higher than in any of the 5 preceding years. The disease was less prevalent in the South Atlantic and East South Central regions than it was at this time last year, but the figures were considerably in excess of the normal seasonal expectancy. Virginia reported 50 cases for the current period, as compared with an average (1931–35) of 20 cases; Florida, 45 as compared with 5; Kentucky, 66 as compared with 35; and Alabama, 60 as compared with 8. In the East North Central region the number of cases was the lowest for this period in recent years. Other regions reported about the normal seasonal incidence.

Poliomyelitis.—The number of cases of poliomyelitis reported for the 4 weeks ended April 24 was 96, as compared with 47, 77, and 91 for the corresponding period in 1936, 1935, and 1934, respectively. The cases were distributed among the various geographic regions as follows: New England and Middle Atlantic, 9 cases; South Atlantic, 18; East North Central, 10; West North Central, 5; East and West South Central, 27; and Mountain and Pacific, 27. While the figures for the South Atlantic and South Central regions were not large, they represented the highest incidence in those regions in recent years. Other regions reported about the normal incidence for this season.

Scarlet fever.—For the current 4-week period 29,478 cases of scarlet fever were reported. The incidence was about 10 percent below that for the corresponding period in each of the two preceding years, but it was more than 25 percent in excess of the average incidence for the years 1930–34, inclusive. Of the various geographic regions, the New England and West South Central reported slight increases over the figures for this period in 1936; the South Atlantic and Mountain and Pacific regions reported appreciable decreases; while in the North Central and East South Central regions the incidence stood approximately at last year's level. In the Mountain and Pacific regions, where the disease has been unusually prevalent, 1,756 cases were reported for the current period, as compared with 3,850 in 1936 and 3,147 in 1935.

Diphtheria.—The decline in the incidence of diphtheria continued. The number of cases (1,724), however, represents a decrease from the figure for the corresponding period in 1936 of only about 5 percent, while in preceding years a decline from year to year of approximately 20 percent has been maintained. The East South Central and Pacific regions reported excesses over last year of 10 and 20 percent, respectively.

Typhoid fever.—The incidence of typhoid fever was somewhat below that of recent years, 443 cases being reported for the current period,

as compared with 520, 568, and 624 for the corresponding period in 1936, 1935, and 1934, respectively. The situation was favorable in all sections of the country except in the South Central, where the incidence was considerably higher than at this time last year.

Measles.—For the 4 weeks ending April 24 there were reported 45,102 cases of measles, a figure about 10 percent below the relatively low level of 1936. Excesses over last year were reported from the South Atlantic, East North Central, and South Central regions. The number of cases in the West North Central region was only about 30 percent of last year's figure for this period, while in the Mountain and Pacific region the current incidence was less than 20 percent of that for last year.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ending April 24, based on data received from the Bureau of the Census, was 12.8 per 1,000 inhabitants (annual basis). The current rate was lower than that (13.3) for the corresponding period in 1936 but slightly above the average rate (12.2) for the years 1931 to 1935, inclusive.

RURAL SANITATION BY EMERGENCY RELIEF WORKERS[1]

By J. O. Dean, *Passed Assistant Surgeon*, and Kay Pearson, *Editorial Assistant, United States Public Health Service*

For a period of 12 months the United States Public Health Service conducted an intensive study of the program of the local health department in the rural section of Forsyth County, N. C. During the course of this study, the Federal Government, through the State health department, inaugurated, within the nonurban areas of the county, an emergency relief project designed to further sanitation through the building, rebuilding, or repairing of privies. Since it was directed by the sanitation officer employed by the county health department, this project became a part of the local program and thereby subject to analysis by the United States Public Health Service.

If the study is to be of value in formulating health services, it should provide certain data that will serve as criteria for agencies which may later be engaged in the advancement of sanitation. Such data may be found in the answers to the three questions: Within a county supporting a well-organized health department, what was the sanitation status as expressed by the condition of the water supply and excreta disposal facilities? What were the worth-while disclosures concerning privy construction and deterioration? What were the structural improvements effected by emergency relief workers employed on an assignment so well defined that the results were easily measurable? It is the purpose of this paper to answer these questions, laying particular emphasis upon the structural improvements.

[1] From Division of Public Health Methods, National Institute of Health, in cooperation with Division of Domestic Quarantine.

What was the Sanitation Status?

A summary description of the compass of the survey and of the procedures of the administrators must be given before the first question can receive adequate consideration. It should be made clear that the Federal sanitation project studied by the Public Health Service did not mark the beginning or end of such services within the county; nor did it, chiefly because of lack of time, succeed in reaching every facility requiring improvement. During the entire project, inspections were made of the water and excreta disposal facilities on 3,019 premises situated in the rural area of Forsyth County. Of these premises 2,833 were residences, 130 were of a nonresidential type, comprising churches, schools, railway stations, business establishments, and similar types, and 56 were unspecified as to type or use. As 91 of the residences were unoccupied, there remained 2,742 occupied residences, which represented approximately the same number of families.[2] An estimate of the total number of families residing in Forsyth County, exclusive of the city of Winston-Salem, was 8,260 in 1934. Based on this total, about one-third of the rural homes were inspected. A comparison of the population characteristics, as described by the sanitarians in charge of the project, with similar information published in the United States census reports showed that the families included in the survey were representative of the aggregate rural families in Forsyth County.

In the initial survey, the sanitarians described certain social and economic characteristics of the occupants of the premises and then recorded data pertaining to the source and safety of the water supply. If the home or other premises was supplied by a central system, the safety of the water was recognized as a matter of course. Springs and wells were classified as safe, unsafe, or of questionable safety, depending upon the inspector's estimate of the extent to which the water was protected from surface pollution.

Of the 3,019 premises inspected, 240 received from the inspector no classification as to type or safety. It may be seen in table 1 that by far the greater portion of the other 2,779 premises were supplied by wells, the total being 2,557, or 92 percent. The remaining 222 systems, 8 percent, were so distributed that springs represented 2.6 percent, central connections 5.3 percent, and dual sources only 0.1 percent.

As shown in table 1, only 44 percent of the premises provided with some type of supply were classed by the sanitarians as safe, while 56 percent were unsafe or of questionable safety. The 240 premises that had no evident source of supply or that received no specification

[2] A family, for the purposes of this paper, is defined as any group of individuals, exclusive of those in institutions and labor camps, living under the same roof and eating from the same table.

as to type would undoubtedly increase the percentage of the latter group. Though the Federal project made no provision for the direct improvement of the means for securing water, it is reasonable to assume that the percentage of safe supplies was increased by the reconditioning of the excreta disposal facilities.

TABLE 1.—*Type and safety of water supply at the first inspection of the premises which maintained one or more systems*

Type	Total	Percent of each type		Type	Total	Percent of each type	
		Safe	Unsafe or of questionable safety			Safe	Unsafe or of questionable safety
Total	[1] 2,779	44	56	Central systems	147	100	0
Wells	2,557	42	58	Dual systems	2	50	50
Springs	73	15	85				

[1] This total does not include 240 premises receiving no specification as to type of water supply or state of sanitation.

The investigation of the sources of water supply was only incident to the detailed examination of excreta disposal facilities. The sanitarians noted the type and condition of the system used for the disposal of excreta, itemized the particular defects of the privy, and listed the materials required for the necessary corrections. At the final visit they enumerated separately on the report form each repair or construction and gave their approval to the finished structure if the alterations were satisfactory. In supplying information as to the type of the facility, they ascertained whether the premises was connected with a sewer or maintained a septic tank, a privy, or no means of disposal. The alteration of a sewer connection or a septic tank was considered beyond the jurisdiction of this particular project. If the privy had been constructed only a few months previously, it was described as new. If the construction was such as to prevent soil pollution and the access of flies to the contents, the privy was classed as sanitary. The term "approved", as employed in this paper, denotes that the facility was both sanitary and in good repair.

The number of excreta disposal facilities, 3,083, is greater than the number of premises receiving visits, since 64 of such facilities were situated on premises such as schools or filling stations which necessitated two or more toilets. For statistical purposes, the premises with no facilities have been considered in this paper as maintaining insanitary ones, unless other groupings have been specified. The records of the officials in control of the project made known the type and the sanitation of 3,032 excreta disposal facilities, the remaining 51 being of unspecified type and sanitation, as shown in table 2. Just as the rurality of the area was responsible for the fact that 92 percent

of the premises relied on wells, so it accounted for the fact that 84 percent of the facilities maintained on the various premises were privies. Septic tanks numbered 203, or 7 percent. The other 9 percent, 286 premises, were without any means of disposal.

TABLE 2.—*Type and sanitation of the excreta disposal facilities at the first inspection*

Type	Total	Percent of each type	
		Sanitary	Insanitary
Total	[1] 3,032	17	83
Privies	2,543	13	87
Septic tanks	203	99	1
No facilities	286	0	100

[1] This total does not include 51 facilities of unknown type and sanitation.

Table 2 shows that the supervisors of the work relief project regarded 87 percent of the privies as insanitary. Septic tanks were almost uniformly conceded to be sanitary, only 1 percent deviating from the standard. Certainly the 286 premises not affording any device for excreta disposal represented a positive state of insanitation. When the totals were computed, they indicated that 83 percent of all facilities, including, of course, the premises with no disposal systems, were characterized as insanitary.

What were the Disclosures Concerning Privy Deterioration?

For the purpose of this study, the major structural parts of the privy were grouped into three sections: First, the foundation, which included the pit, curb, sills, and the mound; second, the interior which comprised the floor, seat box, lid and hinges, and vent; and third, the house, which consisted of the walls, roof, and gutter.

In order to measure accurately the extent of deterioration, it is necessary to determine both the age of the privy and the plan of construction. The knowledge that privies had formerly been constructed throughout of wood, and that a very active sanitation campaign focused on the reconditioning of excreta disposal facilities had been conducted by the local health department in 1924 and 1925, establishes a limited basis for measuring deterioration. Of course it must be recognized that intermittent repair services had been rendered by the occupant or owner of the premises during the interim between the earlier sanitation project and the recent one. Nevertheless, the endeavors of the emergency relief workers afforded an opportunity to evaluate the durability of many of the repairs and constructions which had undergone the weathering of a decade.

Information as to the condition of the facilities is supplied by table 3, which designates the percentage that were satisfactory, in need of repairs, or in need of replacement. The percentages, 15, 73, and 12,

following the order of the designations in the preceding sentence, graphically portray the volume of work confronting the employees participating in the project.

TABLE 3.—*Condition of the excreta-disposal facilities according to the appraisal of the sanitarians*

Type	Condition of the excreta-disposal facilities			
	Total	Satisfactory	In need of repairs	In need of replacement
Total	[1]2,753	418	2,002	333
Percent	100.0	15	73	12
Old privies	2,484	187	1,967	330
New privies	66	30	33	3
Septic tanks	203	201	2	0

[1] This total does not include 286 premises with no facilities and 44 facilities of unspecified type.

Analysis of particular defects, as in table 4, introduces a new basis of enumeration, dealing not with 3,083 excreta-disposal facilities but with the manifold defects as indicated by the number which the sanitarians reported and by the additional number which the carpenters revealed in the course of their work. The figures apply only to the 2,372 privies receiving an itemized record of defects, not to those which were condemned outright. The composite total of 8,986 indicates an average of 3.8 defects for each privy possessing impairments that were itemized.

TABLE 4.—*Occurrence of defects as indicated by the number reported by the sanitarians and by the additional number revealed by the carpenters* [1]

Structural parts	Total	Number of defects reported by sanitarians	Number of additional defects revealed by carpenters
Total	8,986	6,279	2,707
Percent	100.0	70	30
Foundation	4,706	3,554	1,152
Pit	1,658	1,495	163
Sills	1,433	1,184	249
Curb	1,364	680	684
Mound	251	195	56
Interior	2,071	1,390	681
Seat	750	447	303
Floor	637	429	208
Vent	380	268	112
Lid or hinges	304	246	58
House	2,209	1,335	874
Walls	1,053	640	413
Gutter	1,016	617	399
Roof	140	78	62

[1] The figures apply only to the 2,372 privies receiving an itemized record of defects.

Ranking first in the number of defects enumerated by the sanitarians was the foundation, with a total of 3,554, which was 57 percent of the number of privy defects reported. The remaining defects were

almost equally distributed between various parts of the interior, with 1,390, or 22 percent, and parts of the house, with 1,335, or 21 percent. The total number of defects reported as occurring in the three sections of the structures was 6,279 at the primary inspection. Of more interest is the distribution of the defects among the separate parts of the privy. The pit was noted as unsatisfactory in 1,495 privies, or 56 percent of those under consideration. Second to the pit in the prevalence of defects were the sills, with a total of 1,184. The curb, next in number, appeared to be imperfect in 680 instances; the walls, in 640.

The number of additional defects discovered by the carpenters serves not only to reveal the aggregate number of imperfections but to gage the success of the sanitarians in their search for defects. Since 2,707 parts of the privy, although not described by the sanitarians as defective, received repairs, the conclusion is that the first inspection failed to reveal about one-third of the existing impairments.

What Were the Structural Improvements?

According to the plan of the Federal project, the owner or occupant of the premises was expected to procure all material which the sanitarian considered necessary, and the administrators were obligated to supply sufficient labor to complete the prescribed repairs or construction. Through the recommendations made by the sanitarians, need for the following alterations or improvements was manifested: Erection of new privies, 596; reconstruction of privies, 83; repairing of privies, 1,980; and destruction of privies, 6. It goes without saying that the 286 premises without facilities were included in the group receiving the recommendation for new structures. Even though the sanitarians declared 330 privies to be sanitary, it is known that 113 of these received suggestions as to repairing or rebuilding, thereby indicating that it was the purpose of the supervisors to make the renovation as thorough as possible.

The major service in the light of the recommendations was the installation or rebuilding of 743 privies, whereas only 679 new or rebuilt had been requested by the sanitarians. Five structures were destroyed, leaving unchanged only one of the six originally receiving recommendations for destruction. The records show that 1,321 privies received repairs that coincided with the recommendations of the sanitarians. The difference between this number and the number of recommendations based on repairs (1,980) is attributable to lack of time, to developments that altered earlier decisions, to independent action on the part of the owner or occupant, or to failure to accord with recommendations during the study year.

From the standpoint of the disclosure of defectiveness in the privies, not from the recommendations made, the success of the enterprise can also be determined. Of the 286 premises without

facilities, 70 percent installed privies, while 30 percent received no service. Nearly 6 percent of 418 facilities found to be without obvious defects had alterations. Almost three-fourths of the 333 privies needing replacement were built new or rebuilt. There were 1,665 privies listed as having from 1 to 4 defects. Of this number, 13 percent were replaced or rebuilt, 18 percent were unchanged, and 69 percent were repaired. Only 335 structures were seriously defective, that is, had from 5 to 9 defects; and of these, 24 percent were replaced or rebuilt, 18 percent received no improvement, and the other 58 percent were repaired.

The rapidity with which the foregoing improvements on each facility were completed is disclosed by the length of the interval between the first inspection by the sanitarians and the date on which approval of the finished structure was given. These intervals varied from 1 day to something more than 45 days. The average number of days required for the reconditioning of a facility was 15. In view of the fact that the occupant was usually allowed a 10-day period in which to assemble the necessary materials and that approval of the work was sometimes delayed, the average interval of only 2 weeks shows that the actual labor required a very brief period.

TABLE 5.—*Changes effected in excreta disposal facilities by the emergency relief workers, as indicated by the character of the facilities at the first and last visits by the sanitarian*

Character of the facilities	Facilities at first visit		Facilities at last visit	
	Number	Percent	Number	Percent
Total	3,083	100.0	3,083	100.0
Total approved	418	13.5	2,462	79.8
Privies	217	7.0	2,261	73.3
Septic tanks	201	6.5	201	6.5
Total unapproved	2,665	86.5	621	20.2
Sanitary privies	113	3.7	0	0
Insanitary privies	2,264	73.4	528	17.1
Insanitary septic tanks	2	.1	2	.1
No facilities	286	9.3	91	3.0

Table 5 presents a summary of the changes effected by the workers as indicated by the character of the facilities at the first visit by the sanitarian and at the last visit. The number of defective and insanitary privies plus the number of premises having no means of disposal dropped from 2,665, or 86.5 percent of the total inspections, to 621, or 20.2 percent. On the other hand, the number receiving unqualified approval rose from 418 facilities, or 13.5 percent, to 2,462, or approximately 80 percent. All of the privies in the other 20 percent cannot be classed as unsatisfactory, for many of them received services that were not reported, more than 200 records having

no carpenter's report attached or no evidence of approval indicated by the signature of a sanitarian. In case the owner, without assistance from the Emergency Relief Administration, carried out the recommendations made by the sanitarians, the relief agency took no credit for the service. A conservative estimate of the number of improvements resulting indirectly from the stimulus afforded by the Federal project places the total at 300 additional facilities, or 10 percent of the surveyed group. Insofar as the survey was concerned, with the addition of this 10 percent to the 80 percent definitely approved, 90 percent of the inspected facilities were in a sanitary condition.

Again it should be recalled that these structural improvements were accomplished within a period of 1 year and that they applied to approximately one-third of the rural premises. Subsequent to the close of the study, a modified project was introduced in which relief labor was used to augment the basic program of the health department; hence it is reasonable to suppose that a great portion of the remainder of the premises have been raised to the sanitation level of the group included in the original survey. Perhaps it should be pointed out that these efforts of the local health department and of the emergency relief workers have been facilitated by the existence of a State law which permits the enforcement of privy-sanitation regulations.

SUMMARY OF ACHIEVEMENTS

A final enumeration of the actual results of the project in Forsyth County involves all data accumulated in response to the three queries which constitute this study. First, an investigation of the status of the water and excreta sanitation of the county, as typified by the premises or facilities included in the survey, established the fact that 56 percent of the sources of water supply were not constructed in accordance with recognized principles of water protection, and that 83 percent of the excreta-disposal facilties were insanitary. Second, through the medium of the itemized repairs, there was presented an index of privy deterioration which showed that the pit, sills, curb, and walls were most frequently defective. And last, through the construction of 743 new or rebuilt privies, the reconditioning of 1,321, and the furthering of improvements in an additional 300 structures, the percentage of insanitary excreta-disposal facilities was reduced from 83 to 10.

DIBENZANTHRACENE TUMORS IN MICE

The Production of Subcutaneous, Pulmonary, and Liver Tumors by Serum Dispersions and Lard Solutions [1]

By H. B. ANDERVONT, *Biologist*, and EGON LORENZ, *Biophysicist, United States Public Health Service*

Since the observation by Burrows, Hieger, and Kennaway (*8*) that the subcutaneous injection of a lard solution of 1, 2, 5, 6–dibenzanthracene evokes spindle cell tumors in experimental animals, other investigators have found that this and other carcinogenic agents are capable of producing tumors at the site of injection when administered in a variety of media. The reader is referred to a recent review by Cook, Haslewood, Hewett, Hieger, Kennaway, and Mayneord (*10*) for a comprehensive discussion of the various media in which chemical compounds have proved to be carcinogenic.

In a previous paper (*11*) a method for preparing dispersions of 1, 2, 5, 6–dibenzanthracene in the sera of horses, dogs, and fowls was described. The present communication deals with the results attending the intravenous or subcutaneous injection of mice with the horse- or dog-serum dispersions as well as lard solutions of the carcinogenic hydrocarbon.

PREPARATION OF DISPERSIONS

Since the appearance of the earlier paper, it has been possible to obtain dispersions of higher concentrations by refining the method of preparation. A dispersion of 1, 2, 5, 6–dibenzanthracene in dog serum containing 0.3 mg of the hydrocarbon in each cubic centimeter of serum and an approximately homogeneous dispersion containing 1 mg of the hydrocarbon in each cubic centimeter of horse serum saturated with cholesterol were obtained, both of which were suitable for intravenous injection. The refinement of the method of preparation consisted mainly in determining the most favorable temperature for the formation of the dispersions.

The dispersion of the compound in dog serum was made as follows: A dog was given a meal of fatty meat, and 3 hours later 420 cc of serum were obtained by bleeding from the carotid artery, overnight clotting, and centrifugation. To the 420 cc of serum were added 120 mg of 1, 2, 5, 6–dibenzanthracene (melting point 267–268° C.) dissolved in approximately 400 cc of ether. The mixture was shaken for 4½ hours at room temperature and all the serum fat was dissolved in the ether. The ether was blown off at moderate speed and the temperature kept at approximately 38° C. Then the serum was filtered through a Büchner funnel through two layers of finely textured filter paper. The spectroscopic test (*12*) gave a content of 0.3 mg of the compound to each cubic centimeter of serum.

[1] From the Office of Cancer Investigations, U. S. Public Health Service, Boston, Mass.

An approximately homogeneous dispersion of 1, 2, 5, 6–dibenzanthracene in horse serum saturated with cholesterol was prepared as follows: To 150 cc of horse serum were added 100 cc of a saturated cholesterol-ether solution. This mixture was shaken for 1 hour at room temperature, the ether blown off at approximately 38° C., and the mixture was then filtered through paper. To 100 cc of the horse serum saturated with cholesterol, 100 mg of the hydrocarbon in 280 cc of ether were added. The ether was blown off at a temperature between 0° C. and 4° C., with moderate speed and vigorous agitation of the mixture by shaking. In this manner a dispersion was obtained which was nearly homogeneous and contained 1 mg of the hydrocarbon in each cubic centimeter.

EXPERIMENTAL ANIMALS

Pure strain mice of strains A, M, C_{57} black and C_{57} brown were obtained from the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Maine. Mice of strain C_3H were also employed. These were the descendants from a litter of C_3H mice procured in October 1930 through the kindness of Dr. L. C. Strong of the Bar Harbor Laboratories. Only brother to sister matings have been carried out since the arrival of these mice in this laboratory.

EXPERIMENTAL

Experiment 1.—During August 1934, mice were injected intravenously with 1 cc of a solution of 1, 2, 5, 6–dibenzanthracene in horse serum containing 1.5 mg of the hydrocarbon in each liter of serum; thus, each mouse received 0.0015 mg of the carcinogenic agent. The injected mice consisted of 22 strain A, 9 strain M, 13 strain C_{57} brown, and 13 strain C_{57} black animals. Nine months later 14 strain A, 9 strain M, 11 strain C_{57} brown, and 8 strain C_{57} black mice were living. These mice were killed and examined for macroscopic evidence of tumor growth and all were free from tumor. Either the amount of carcinogenic agent was too small or the animals were killed too early to obtain tumors.

Experiment 2.—In this experiment mice of strains A, C_3H, and M were injected subcutaneously or intraperitoneally with a lard–dibenzanthracene solution or a horse-serum dispersion of the carcinogenic agent during September 1935. Each mouse received 1 mg of 1, 2, 5, 6–dibenzanthracene in either lard or horse serum. Details of the experiment are omitted because a large number of the experimental animals succumbed to an epidemic of *B. piliformis* (*16*). However, the lard solution, as well as the serum dispersion, evoked spindle-cell tumors in both subcutaneous and intraperitoneal tissues. Surviving mice were killed during June 1936, and the presence of 1, 2, 5, 6–dibenzanthracene was detected at the site of subcutaneous or intra-

peritoneal injection by means of its characteristic fluorescence in ultra-violet light.

In this experiment both the lard solution and horse-serum dispersion produced tumors at the site of injection in all 3 strains of mice. It is also of interest that some of the carcinogenic agent remained at the site of injection for at least 9 months.

Experiment 3.—A dog-serum dispersion containing 0.14 mg of 1, 2, 5, 6–dibenzanthracene in each cubic centimeter of serum was used in this experiment.

During October 1935, 7 strain A mice were each given intravenous injections of 0.5 cc of the serum daily for 4 successive days, making a total of 2 cc of serum containing 0.28 mg of 1, 2, 5, 6–dibenzanthracene. Eleven strain M mice each received 3 similar injections on successive days, making a total of 0.21 mg of 1, 2, 5, 6–dibenzanthracene for each animal.

One strain A animal died 3 months later and was found to be free from tumor. The remaining 6 strain A mice were killed 4 months after the first intravenous injection, and 5 revealed multiple pulmonary tumors when autopsied.

Four of the strain M mice were killed and autopsied 7 months after receiving their first injection. All were free from tumor. The remaining 7 strain M mice were killed 1 year after the time of injection; 6 did not have any macroscopic tumor growth and 1 had 2 primary lung tumors.

The results of the experiment show that pulmonary tumors were induced in strain A and in strain M mice by intravenous injections of a dog-serum dispersion of the hydrocarbon.

Experiment 4.—The primary purpose of this experiment was to ascertain whether intravenous injections of 1, 2, 5, 6–dibenzanthracene exerted any influence upon the time of appearance of subcutaneous tumors induced by a subsequent subcutaneous injection of the same compound. With this end in view, 24 strain C_3H male mice were given intravenous injections of a dog-serum dispersion containing 0.14 mg of 1, 2, 5, 6–dibenzanthracene in each cubic centimeter of serum. The injections were begun on November 4, 1935, and lasted for 5 successive days. On the first day each mouse was given 0.1 cc of the serum, on the second day 0.2 cc, on the third day 0.3 cc, on the fourth day 0.4 cc, and on the fifth day 0.5 cc. Thus, each animal received a total of 1.5 cc of the serum containing 0.21 mg of 1, 2, 5, 6–dibenzanthracene. On November 15, 1935, each mouse was injected subcutaneously in the right axilla with 0.2 cc of a lard solution of 1, 2, 5, 6–dibenzanthracene containing 0.8 mg of the hydrocarbon. Twelve other C_3H male mice were also injected subcutaneously with a similar amount of the lard–dibenzanthracene solution as controls.

The first subcutaneous tumor was noted on February 18, 1936, at which time all the mice were alive. All 12 of the controls developed only subcutaneous tumors prior to May 5, 1936. Up to April 29, 1936, 10 of the serum-injected mice had developed subcutaneous tumors only, but of the remaining 14 which came to autopsy after April 29, 1936, 13 had subcutaneous tumors; and of these, 4 also had multiple primary adenocarcinomas in their lungs. In addition to subcutaneous and lung tumors one mouse had developed a liver growth measuring 4 mm in diameter which histological studies revealed to be a hepatoma. The last experimental mouse died on June 8, 1936, and had not developed a tumor.

In this experiment pulmonary tumors and one liver tumor arose in strain C_3H mice receiving intravenous injections of a dog-serum dispersion and a subsequent subcutaneous injection of a lard solution of the tumor-inducing compound. Since only subcutaneous tumors appeared in the control mice, the results indicate that the dog-serum dispersion evoked the growths in the internal organs of the experimental mice.

Experiment 5.—This was a repetition of experiment 4. The results of the previous experiment had given some indication that the animals receiving the serum dispersion intravenously were more resistant than the controls to the development of subcutaneous tumors induced by 1, 2, 5, 6–dibenzanthracene. Hence, the procedure was repeated and larger amounts of the compound were administered intravenously by using a dog-serum dispersion containing 0.3 mg of 1, 2, 5, 6–dibenzanthracene in each cubic centimeter.

Twenty strain C_3H male mice were each given 6 intravenous injections on successive days—the first on May 4, 1936, consisting of 0.2 cc, the second and third consisting of 0.3 cc, the fourth and fifth consisting of 0.4 cc and the sixth consisting of 0.5 cc. Each animal was injected with 2.1 cc of the dog-serum dispersion containing 0.63 mg of 1, 2, 5, 6–dibenzanthracene. On May 15, 1936, the intravenously injected mice and 20 normal C_3H males were each injected subcutaneously in the right axillary region with 0.2 cc of a lard-dibenzanthracene solution containing 0.8 mg of the carcinogenic agent.

The first subcutaneous tumor was found on August 20, 1936. Between this time and November 27, 1936, all the intravenously injected mice developed subcutaneous tumors in the right axilla and, in addition, five also developed primary pulmonary tumors. Sixteen of the 20 controls developed subcutaneous tumors during the same period and one of these had adenocarcinoma in its lungs. The four remaining control animals were kept until January 18, 1937, when they were killed. One had developed a small subcutaneous tumor in the right axilla and was free from tumor in other sites. The three

other mice were without tumor at the site of injection but had tumors in their lungs or liver. One had two lung nodules measuring 4 mm and 2 mm in diameter, respectively, and a liver mass measuring 9 mm diameter; one had three lung nodules, all of which were 3 mm in diameter, and a liver growth 6 mm in diameter; while the last had a single lung nodule 3 mm in diameter and a liver growth 4 mm in diameter. When the lung and liver growths were examined microscopically, it was found that the lung nodules were adenocarcinomas and the liver growths were hepatomas.

The production of lung tumors in the experimental C_3H mice confirmed the findings in experiment 4. The occurrence of lung and liver tumors in the control mice receiving a single subcutaneous injection of the lard solution shows that intravenous injections are not essential for the production of such tumors.

Experiment 6.—Twenty strain A female mice approximately 3 months old were given intravenous injections of a horse-serum dispersion of 1, 2, 5, 6–dibenzanthracene containing 0.1 mg of the compound in each cc of serum. The injections were begun on November 13, 1935, and consisted of 0.5 cc of the serum to each mouse for 10 successive days. Each animal received a total of 5 cc of serum containing 0.5 mg of 1, 2, 5, 6–dibenzanthracene. Two of the mice died during the series of injections and four were used for other purposes between November 25, 1935, and December 11, 1935. On May 13, 1936, six of the mice were killed, and all had multiple lung tumors. On October 5, 1936, the remaining eight mice were killed and autopsied. All had large multiple lung tumors (fig. 1) and one had developed a hepatoma.

The horse-serum dispersion produced pulmonary tumors in strain A mice when injected intravenously. This finding is similar to that of experiment 3 in which a dog-serum dispersion was employed for intravenous injection of strain A animals.

Experiment 7.—One of the reasons for performing this experiment was to test for the relative carcinogenicity of a lard solution and horse-serum dispersion of 1, 2, 5, 6–dibenzanthracene. The materials were injected on January 22, 1936. Sixty strain C_3H virgin female mice were used; 30 of these were injected subcutaneously in the right axilla with 0.25 cc of lard solution containing 1 mg of 1, 2, 5, 6–dibenzanthracene and the other 30 were injected in the same region with 1 cc of horse serum containing 1 mg of the compound in each cubic centimeter.

The first tumor was noted on April 14, 1936. The time of appearance of induced tumors in the two groups is summarized in table 1. The experiment was discontinued on September 24, 1936, when 7 of the mice (4 lard-injected and 3 serum-injected) were killed and autopsied; all were free from tumor. For the sake of comparison,

the table also includes another series of 24 C_3H female mice receiving a subcutaneous injection of 0.1 cc of glycerine containing 1.6 mg of 1,2,5,6-dibenzanthracene on February 25, 1936. Four of the mice were living and free from tumor on November 14, 1936, when the experiment was discontinued.

TABLE 1.—*Experiment 7: Time of appearance of subcutaneous tumors induced in C_3H mice by 1, 2, 5, 6-dibenzanthracene when injected as a lard solution, as a horse-serum dispersion, or as crystals*

Time in weeks		12	14	16	18	20	22	24	26	28	30	32	34	36	Total number of tumors	Number killed or died without tumor
Form of dibenzanthracene and amount injected	Number of mice injected	Number of tumors														
Lard solution, 1 mg	30	4	1	2	6	3	3	1	2	2	1	----	1	----	26	4
Horse-serum dispersion, 1 mg	30	----	----	2	3	4	3	4	1	3	3	----	2	2	27	3
Crystals in glycerine, 1.6 mg	24	----	----	1	1	2	3	2	1	1	----	2	2	1	16	8

In table 1, it is seen that tumors appeared earlier in the mice injected with the lard solution and that both the lard solution and horse-serum dispersion evoked subcutaneous tumors earlier than did the crystalline material.

One lard-solution mouse was found to have several primary pulmonary adenocarcinomas when autopsied 33 weeks after receiving the subcutaneous injection. Seven of the serum-injected mice had primary lung tumors when autopsied; the first of these was found 24 weeks after the time of injection. Thus, the carcinogenic compound again produced pulmonary tumors in strain C_3H mice.

Experiment 8.—In this experiment strain C_3H male mice were given injections of a lard solution and a dog-serum dispersion of the carcinogenic compound. As in Experiment 7, one purpose in performing the experiment was to ascertain the relative efficacy of 1, 2, 5, 6-dibenzanthracene in the different media. The dog-serum dispersion contained 0.3 mg, and the lard solution contained 1 mg of the hydrocarbon in each cubic centimeter. On February 12, 1936, 20 mice received 1 cc each of the dog-serum dispersion subcutaneously in the right axilla and 20 others received 0.3 cc of the lard solution in the same region. The injections were repeated on February 27, 1936. In this manner each mouse was given 0.6 mg of the cancer-producing agent.

The first subcutaneous tumor was noted on May 19, 1936, and the experiment was discontinued on November 24, 1936, when 14 of the serum-injected mice and 3 of the lard-injected mice were killed and autopsied. From May 19 to November 24, 1936, 17 of the lard-

FIGURE 1.—Pulmonary tumors induced in a Strain *A* mouse of Experiment 6 by intravenous injections of a horse-serum dispersion of 1, 2, 5, 6-dibenzanthracene.

FIGURE 2.—Pulmonary adenocarcinoma induced in a C_3H mouse of Experiment 8 by subcutaneous injections of a dog-serum dispersion of 1, 2, 5, 6-dibenzanthracene.

FIGURE 3.—Hepatoma induced in a C3H mouse of Experiment 8 by subcutaneous injections of a lard solution of 1, 2, 5, 6-dibenzanthracene.

injected mice and 6 of the serum-injected mice had developed tumors at the site of subcutaneous injections.

The interesting feature of the experiment was the presence of lung and liver tumors in the 17 mice (14 serum-injected and 3 lard-injected) killed on November 24, 1936. None had developed a tumor at the site of injection. Of the 14 mice receiving the dog-serum dispersion, 8 had multiple lung nodules and 2 had large single lung nodules. Histological studies of the nodules revealed that they were adenocarcinoma (fig. 2). One of the 3 surviving lard-injected mice also had a tumor in its lung.

In addition to pulmonary tumors, some of the 17 surviving mice had masses within or attached to their livers. Of the 14 serum-injected mice, 2 had multiple liver growths and 4 had large single growths: and of the 3 lard-injected mice, 2 had huge masses within their livers. The liver growths ranged in size from 6 mm in diameter to large pedunculated and lobulated growths measuring 22 by 15 by 15 mm (fig. 3). Stained preparations showed that all were hepatomas. Histological studies of the hepatomas are still in progress.

The time of appearance of subcutaneous tumors and the number of mice developing lung and liver growths are presented in table 2.

TABLE 2.—*Experiment 8: Subcutaneous, liver, and lung tumors found in C_3H mice following subcutaneous injection of 0.6 mg of 1, 2, 5, 6–dibenzanthracene as a lard solution or as a dog-serum dispersion*

Time in weeks		14	16	18	20	22	24	30	32	34	36					
Form of dibenzanthracene injected	Number of mice injected	Number of subcutaneous tumors										Total number of subcutaneous tumors	Killed 11/24/36 free from subcutaneous tumor	Killed 11/24/36 with hepatoma only	Killed 11/24/36 with lung tumors only	Killed 11/24/36 with both hepatoma and lung tumors
Lard solution	20	4	---	6	1	1	2	1	1	1	---	17	3	2	1	------
Dog-serum dispersion	20	---	1	---	---	1	---	---	3	---	1	6	14	2	6	4

It is seen that the lard solution was far more effective than the dog-serum dispersion in producing subcutaneous spindle-cell tumors.

DISCUSSION

The appearance of spindle-cell tumors at the site of subcutaneous or intraperitoneal injections of the horse and dog-serum dispersions of 1, 2, 5,6–dibenzanthracene is in accord with the findings of other investigators who have used colloidal suspensions of the carcinogenic hydrocarbon. The presence of pulmonary tumors in strain A mice

following intravenous injections of 1,2,5,6–dibenzanthracene is similar to the results (*2*) obtained after subcutaneous injections of a lard solution of the compound.

The appearance of induced tumors in the lungs of strain A mice (*3*) or in the lungs of their offspring (*4*) implies that these growths can be evoked more frequently in those mice which possess a tendency to develop them spontaneously. The carcinogenic agent increases the number of lung tumors and accelerates their appearance in susceptible mice. This increase in frequency and acceleration of formation caused by a known cancer-inducing compound, suggests that the chemical acts in the same manner as, or supplements, an unknown agent responsible for the appearance of spontaneous lung tumors.

In this laboratory, mice of various inbred strains have been given subcutaneous injections of lard–dibenzanthracene solutions and, until the experiments recorded in this paper, only the lungs of strain A mice or of their offspring have proved to be especially susceptible to this carcinogenic agent. This organ susceptibility presents difficulties in experiments designed to elucidate the problem as to why lung tumors arise in mice injected with carcinogenic compounds; for, so long as the growths are induced only in mice known to possess a special organ susceptibility, it is impossible to ascertain whether the carcinogenic action of the agent is purely local in the lungs or whether it produces a constitutional change in the animals of which the lung tumors are a local manifestation. In order to present evidence that the tumors are induced by contact of lung tissues with a carcinogenic compound, it appears to be essential that they be produced in an inbred strain of mice which do not develop them spontaneously except, perhaps, in rare instances.

It is known that the C_3H mice used in these experiments exhibit a low incidence of spontaneous pulmonary growths. This strain was started in 1920 by Strong by crossing a male of the Little dilute brown strain and an albino female obtained from Dr. Bagg. The establishment of the C_3H strain and their susceptibility to spontaneous growths was reported by Strong (*14*) in 1935, and in this communication he states as follows: "The C_3H strain is to be considered a highly susceptible cancer family only so far as cancer of the female mammary gland is concerned. In regard to the tumors of the other organs, it is still to be considered a resistant strain since tumors other than those of the mammary gland have never been encountered in a period of 15 years." Bittner (*5*) reported on the C_3H strain in 1935 and states [2] that "To date, no tumors of any description have been observed in the males of this stock."

From the results of these experiments with C_3H mice it may be said that subcutaneous or intravenous injections of dibenzanthracene have

[2] A personal communication from Dr. Bittner reveals that, since the publication of his paper, 3 tumors, other than mammary gland carcinomas, have been found in his line of C_3H mice.

induced pulmonary tumors in members of a strain of mice which do not possess a tendency to develop many of them spontaneously. It is known that the susceptibility of the lungs of certain mice to the development of both spontaneous and induced tumors is inherited (*4*), and, as stated previously, the appearance of induced lung tumors in mice possessing this tendency may be interpreted as the influence exerted by the genetic constitution of the animal. It is also known (*1*) that both high and low spontaneous mammary cancer lines of mice are susceptible to the induction of subcutaneous tumors by carcinogenic compounds and it now appears as though an inherited organ susceptibility to development of spontaneous pulmonary neoplasms is not essential for the production of induced lung tumors. The difference in the susceptibility of various strains of mice to induced pulmonary tumors may be a matter of degree only.

The induction of liver tumors in strain C_3H mice may also be of some significance; for, in accord with the published reports of Strong and of Bittner, such growths have been rare in normal mice of this strain which have been raised in this laboratory. One hepatoma has been observed in a female mouse 20 months of age. It is worthy of note, however, that Strong and Smith (*15*) have reported the occurrence of spontaneous hepatomas in strain CBA mice which are related to the C_3H strain. They found such tumors in 14 mice (6 males and 8 females) ranging in age from 18 months to 30.5 months and remark upon the fact that the tumors appeared late in the life of the animals. None of the animals reported in the present communication was over 13 months of age when the induced hepatomas were observed in them. It is tempting to speculate that the C_3H mice may also inherit a tendency to develop both hepatomas and lung tumors late in life and, as in the case of pulmonary tumors in strain A mice, the carcinogenic hydrocarbon accelerates their appearance. Here, again, the hydrocarbon would be simulating the action of an unknown cancer-producing agent. Burrows (*6*) has shown that chronic irritation produced by the subcutaneous injection of certain substances failed to localize 1, 2, 5, 6–dibenzanthracene in the foci of irritation when the hydrocarbon was injected into the animal at a distance from the irritated area. His negative results and the findings recorded in this paper serve to suggest that the susceptibility of particular tissues may be of considerable importance in their reaction to carcinogenic agents.

The appearance of liver growths in mice following the subcutaneous injection of 1,2, 5, 6–dibenzanthracene solutions is of interest, in view of the recent findings of Peacock (*13*) and of Chalmers and Peacock (*9*), who have presented evidence to show that when colloidal 3, 4–benzpyrene or colloidal 1,2, 5, 6–dibenzanthracene are injected intravenously, both of these substances disappear rapidly from the circulating blood. In the case of 3, 4–benzpyrene they found evidence

that this compound, or a derivative, is dissolved in the bile, which suggests that it is eliminated by the liver. No direct evidence was found that 1,2,5,6-dibenzanthracene is eliminated in the same manner. Burrows and Cook (7) have shown that repeated injections of a water soluble compound of 1,2,5,6-dibenzanthracene into mice may be followed by leukemia and in one instance lymphosarcomatosis occurred. In the discussion of their results they state that "Though it might be unjustifiable at the present stage to assert that the chemical compound injected was the cause of both local tumors and the leucaemia, yet it seems possible that this was the case."

The induced lung and liver tumors in strain C_3H mice may be regarded as further evidence that 1,2,5,6-dibenzanthracene produces tumors in organs which are distant from the site of injection. Furthermore, in view of the findings of Peacock and Chalmers, it is suggested that the lung and liver tumors arose as the result of a direct action of dibenzanthracene, or a derivative, upon the tissues of these organs.

When equal quantities of the hydrocarbon were injected subcutaneously in lard solutions or in serum dispersions, the latter materials, particularly the dog serum, were less effective in producing tumors at the injection site but more effective in producing lung and liver growths. It seems possible that these results may be attributed to the type of media in which the compound was administered, for the bulk of the lard solutions remained as subcutaneous deposits while the dispersions disappeared soon after injection. However, lard solutions also produced lung and liver tumors in those animals which did not develop subcutaneous growths before the agent acted upon the tissues of the internal organs.

SUMMARY

Dog-serum and horse-serum dispersions of 1,2,5,6-dibenzanthracene were injected intravenously or subcutaneously and lard solutions of the same compound were injected subcutaneously into pure strain mice. The serum dispersions, when injected intravenously, induced lung and liver tumors, and when injected subcutaneously, produced local tumors at the site of injection as well as lung and liver tumors. Lard dispersion, when injected subcutaneously, evoked local tumors at the injection site and also produced lung and liver tumors.

The appearance of lung and liver tumors in mice injected subcutaneously is evidence that 1, 2, 5, 6-dibenzanthracene is capable of producing tumors in tissues which are distant from the site of injection.

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DEATHS DURING WEEK ENDED APRIL 24, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 24, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	9,071	9,302
Average for 3 prior years	9,009	
Total deaths, first 16 weeks of year	160,429	155,623
Deaths under 1 year of age	552	612
Average for 3 prior years	602	
Deaths under 1 year of age, first 16 weeks of year	9,923	9,429
Data from industrial insurance companies:		
Policies in force	69,763,872	68,464,868
Number of death claims	14,315	14,880
Death claims per 1,000 policies in force, annual rate	10.7	11.4
Death claims per 1,000 policies, first 16 weeks of year, annual rate	11.4	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 1, 1937, and May 2, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended9 May 2, 1936
New England States:								
Maine	1	1	3	3	12	210	0	0
New Hampshire					85	50	0	0
Vermont	1					595	0	0
Massachusetts	4	5			667	1,460.	4	5
Rhode Island	2				183	36	0	1
Connecticut	2	5	6	1	464	167	1	2
Middle Atlantic States:								
New York	47	44	[1] 13	[1] 7	1,281	2,825	13	20
New Jersey	16	12	8	12	2,392	393	8	3
Pennsylvania	32	40			1,113	1,135	13	20
East North Central States:								
Ohio	27	31	27	129	1,086	527	8	29
Indiana	9	5	14	64	332	17	0	4
Illinois	27	32	41	68	282	33	7	18
Michigan	13	11	8	9	160	90	0	4
Wisconsin	1	5	26	63	21	116	2	2
West North Central States:								
Minnesota	3	2		2	23	550	0	4
Iowa	3	2	6	15	15	7	1	2
Missouri	7		61	247	40	20	4	3
North Dakota		1		3		2	0	0
South Dakota	1	4		3	2	6	0	0
Nebraska	5	3			35	32	0	1
Kansas	9	1	24	22	42	20	1	1
South Atlantic States:								
Delaware		1			44	24	0	0
Maryland [2]	6	6	4	10	509	342	4	14
District of Columbia	11	7	2	3	75	126	1	8
Virginia	5	17		235	634	132	9	8
West Virginia	14	11	50	59	123	66	5	9
North Carolina [3]	10	9	31	30	321	48	13	4
South Carolina	7	4	264	223	120	63	1	7
Georgia [3]	2	10	53				3	3
Florida	4	2		19	2	21	0	4
East South Central States:								
Kentucky	10	4	16	119	551	75	15	31
Tennessee	4	7	37	298	44	58	6	7
Alabama [3]	9	11	93	223	12	20	13	8
Mississippi [2]	6	5					0	1
West South Central States:								
Arkansas	7	11	63	146	5	1	1	0
Louisiana	15	8	63	46	2	52	0	7
Oklahoma [4]	9	8	41	215	62	25	0	5
Texas [3]	40	30	479	741	930	584	6	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 1, 1937, and May 2, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936
Mountain States:								
Montana [5]	2	8	10	18	4	17	1	0
Idaho			2	1	13	29	0	1
Wyoming		1			25	2	2	0
Colorado	5	2			19	41	2	0
New Mexico	3	8		3	74	38	0	0
Arizona		6	31	59	102	212	0	2
Utah [2]					23	36	0	1
Pacific States:								
Washington		1		8	53	399	0	2
Oregon [5]	2		29	48	11	210	1	0
California [6]	12	29	198	148	183	2,217	4	4
Total	393	400	1,698	3,300	12,176	13,129	149	246
First 17 weeks of year	8,477	9,459	266,608	128,172	127,959	164,617	2,858	4,192

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936
New England States:								
Maine	0	0	30	18	0	0	0	0
New Hampshire	0	0	4	8	0	0	0	0
Vermont	0	0	4	5	0	0	0	0
Massachusetts	0	0	238	251	0	0	2	0
Rhode Island	0	0	53	18	0	0	1	0
Connecticut	1	0	154	50	0	0	1	2
Middle Atlantic States:								
New York	0	2	985	910	0	0	9	14
New Jersey	0	0	246	460	0	0	3	6
Pennsylvania	0	1	747	460	0	0	5	16
East North Central States:								
Ohio	1	1	442	674	0	0	8	21
Indiana	2	0	177	178	10	1	0	1
Illinois	1	0	725	684	25	7	4	1
Michigan	0	0	765	328	16	1	5	6
Wisconsin	0	0	289	574	7	11	1	1
West North Central States:								
Minnesota	0	0	160	306	1	7	0	0
Iowa	0	0	230	248	80	37	2	0
Missouri	1	0	389	274	48	11	7	2
North Dakota	0	0	30	30	10	4	0	1
South Dakota	0	0	64	70	2	23	1	1
Nebraska	1	0		149	14	17	0	0
Kansas	0	2	326	373	18	42	1	0
South Atlantic States:								
Delaware	0	0	4	4	0	0	1	0
Maryland [2]	0	0	40	72	0	0	1	2
District of Columbia	0	0	12	23	0	0	0	1
Virginia	2	2	17	72	0	0	9	3
West Virginia	0	0	55	46	0	0	2	7
North Carolina [3]	0	0	37	17	2	0	3	0
South Carolina	1	1	3	1	1	0	4	3
Georgia [3]	0	0	10	16	0	0	0	7
Florida	0	1	15	6	0	0	2	2
East South Central States:								
Kentucky	0	0	40	28	0	0	6	4
Tennessee	0	0	11	23	0	0	2	5
Alabama [3]	0	0	6	4	2	1	0	2
Mississippi [2]	0	0	4	4	1	0	2	1
West South Central States:								
Arkansas	0	0	7	3	7	0	1	1
Louisiana	1	0	17	13	0	0	6	5
Oklahoma [4]	0	0	27	54	3	1	4	1
Texas [3]	2	1	139	85	14	1	21	10

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 1, 1937, and May 2, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936	Week ended May 1, 1937	Week ended May 2, 1936
Mountain States:								
Montana [5]	0	0	34	87	69	8	1	0
Idaho	0	0	12	19	5	0	2	0
Wyoming	0	0	7	47	1	8	0	0
Colorado	0	0	62	93	2	2	0	0
New Mexico	0	0	25	51	0	0	2	0
Arizona	0	0	13	18	0	0	1	0
Utah [2]	0	0	13	57	0	2	0	0
Pacific States:								
Washington	0	0	35	82	12	10	2	1
Oregon [5]	2	0	31	26	18	26	1	0
California [6]	2	0	170	276	20	6	6	5
Total	17	11	6,904	7,295	388	226	129	132
First 17 weeks of year	372	270	117,155	132,493	5,485	3,784	1,880	1,829

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended May 1, 1937, 15 cases as follows: North Carolina, 2; Georgia, 4; Alabama, 1; Texas, 8.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended May 1, 1937, 6 cases, as follows: Montana, 2; Oregon, 4.
[6] Psittacosis, week ended May 1, 1937, California, 1 case.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1937										
Montana	1	5	161		162		0	145	118	6
Virginia	51	59	6,642	3	932	6	2	89	1	16
April 1937										
Delaware	3	6	1		186		0	24	0	3

March 1937

Montana:	Cases
Chicken pox	125
Dysentery (bacillary)	1
Encephalitis, epidemic or lethargic	2
German measles	12
Mumps	778
Septic sore throat	5
Trachoma	1
Undulant fever	2
Vincent's infection	1
Whooping cough	25

March 1937—Continued

Virginia:	
Chicken pox	342
Dysentery (bacillary) and diarrhea	41
Encephalitis, epidemic or lethargic	4
Mumps	334
Ophthalmia neonatorum	3
Paratyphoid fever	1
Rocky Mountain spotted fever	1
Septic sore throat	7
Tetanus	1
Tularaemia	1

March 1937—Continued

Virginia—Continued.	
Undulant fever	1
Whooping cough	433

April 1937

Delaware:	
Anthrax	1
Chicken pox	37
German measles	24
Mumps	53
Paratyphoid fever	1
Rabies in animals	1
Septic sore throat	4
Whooping cough	46

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 24, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	213	248	80	7,750	781	2,556	23	432	26	1,515	--------
Current week [1]	152	142	84	4,191	768	2,586	40	462	23	1,568	--------
Maine:											
Portland	0	------	1	0	1	7	0	0	0	3	29
New Hampshire:											
Concord	0	------	0	1	1	0	0	0	0	0	5
Manchester	0	------	2	0	0	4	0	1	0	0	18
Nashua	0	------	--------	0	-------	0	0	-------	0	0	5
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	4
Burlington	0	------	0	0	0	0	0	0	0	5	9
Rutland	0	------	0	1	0	0	0	0	0	0	8
Massachusetts:											
Boston	1	------	0	29	33	68	0	14	1	55	249
Fall River	0	------	1	28	2	0	0	2	0	4	32
Springfield	0	------	0	1	2	7	0	0	0	6	43
Worcester	0	------	0	57	4	6	0	0	0	26	43
Rhode Island:											
Pawtucket	0	------	0	0	0	1	0	0	0	0	20
Providence	0	------	0	161	7	29	0	0	0	10	77
Connecticut:											
Bridgeport	0	------	0	10	2	69	0	1	0	0	40
Hartford	0	------	0	10	1	3	0	1	0	0	38
New Haven	0	------	0	4	0	10	0	0	0	3	29
New York:											
Buffalo	3	------	1	121	13	27	0	10	0	35	164
New York	52	10	5	589	146	461	0	111	4	61	1,657
Rochester	0	7	1	4	10	4	0	1	0	8	73
Syracuse	5	------	0	3	3	40	0	0	0	31	51
New Jersey:											
Camden	0	1	1	6	4	6	0	0	1	3	36
Newark	0	3	0	564	10	11	0	9	0	16	115
Trenton	0	------	1	1	6	12	0	3	1	3	51
Pennsylvania:											
Philadelphia	1	------	6	51	46	264	0	29	2	82	584
Pittsburgh	6	------	5	108	26	40	0	8	0	25	186
Reading	0	------	0	402	4	16	0	0	0	4	22
Scranton	0	------	--------	1	-------	7	0	-------	0	0	--------
Ohio:											
Cincinnati	3	3	3	219	13	26	0	8	0	9	141
Cleveland	0	12	2	177	13	102	0	9	0	51	216
Columbus	2	2	2	11	4	6	0	7	0	11	81
Toledo	0	2	2	242	7	5	0	6	0	34	94
Indiana:											
Anderson	1	------	0	0	2	7	0	0	0	8	9
Fort Wayne	0	------	1	0	3	1	0	0	0	0	29
Indianapolis	0	------	0	354	21	17	0	7	0	44	92
Muncie	0	------	1	0	3	1	0	1	0	0	15
South Bend	0	------	0	1	1	3	0	0	0	1	15
Terre Haute	1	------	0	0	0	3	1	0	0	0	20
Illinois:											
Alton	0	------	0	0	1	4	0	0	0	0	6
Chicago	12	12	4	59	51	327	0	43	0	73	745
Elgin	0	------	0	0	1	0	0	0	0	4	9
Moline	0	1	0	0	0	6	0	0	0	7	5
Springfield	0	1	0	0	1	8	0	0	0	7	80
Michigan:											
Detroit	5	------	5	21	33	392	0	26	1	76	307
Flint	1	------	0	0	6	18	0	0	0	2	2[illegible]
Grand Rapids	0	------	0	50	4	13	0	0	0	40	4[illegible]
Wisconsin:											
Kenosha	0	------	0	0	0	6	0	1	0	0	[illegible]
Milwaukee	0	1	1	12	9	50	0	1	0	24	8[illegible]
Racine	0	------	0	1	1	13	0	2	0	0	1[illegible]
Superior	0	------	0	1	0	4	0	0	0	2	[illegible]

[1] Figures for Flint, Mich., estimated; report not received.

City reports for week ended April 24, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Minnesota:											
Duluth	0	---	0	0	3	16	2	0	0	8	18
Minneapolis	0	---	1	6	4	27	0	5	0	55	98
St. Paul	1	1	1	7	5	13	0	3	0	133	59
Iowa:											
Cedar Rapids	0	---	---	0	---	4	0	---	0	1	---
Davenport	0	---	---	0	---	1	1	---	0	0	---
Des Moines	1	---	---	3	---	45	0	---	0	0	33
Sioux City	0	---	---	0	---	8	3	---	0	0	---
Waterloo	0	---	---	0	---	5	0	---	2	3	---
Missouri:											
Kansas City	2	---	0	1	10	74	0	3	0	16	107
St. Joseph	2	---	0	0	1	23	17	1	0	0	24
St. Louis	6	---	0	13	15	138	1	5	1	86	189
North Dakota:											
Fargo	0	---	0	0	1	3	0	0	0	0	13
Grand Forks	0	---	---	0	---	0	0	---	0	2	---
Minot	0	---	0	0	0	0	0	0	0	0	7
South Dakota:											
Aberdeen	0	---	---	0	---	6	0	---	0	0	---
Sioux Falls	0	---	0	0	0	0	0	0	0	0	7
Nebraska:											
Omaha	0	---	0	1	6	11	11	1	0	9	60
Kansas:											
Lawrence	0	---	0	0	0	1	0	0	0	0	5
Topeka	0	---	2	2	2	8	0	0	0	0	21
Wichita	0	1	1	37	2	4	1	0	0	11	20
Delaware:											
Wilmington	1	---	0	11	3	3	0	1	0	0	20
Maryland:											
Baltimore	9	2	1	443	17	27	0	14	0	88	218
Cumberland	0	---	0	0	0	0	0	0	0	0	15
Frederick	0	---	0	10	1	0	0	0	0	0	7
Dist. of Col.:											
Washington	2	1	0	107	13	18	0	14	1	9	171
Virginia:											
Lynchburg	0	---	0	14	1	0	0	0	0	3	8
Norfolk	0	---	0	8	5	0	0	2	0	3	30
Richmond	0	---	1	2	4	1	0	3	1	5	52
Roanoke	0	---	0	240	2	0	0	0	0	1	14
West Virginia:											
Charleston	0	1	1	1	6	1	0	1	0	0	29
Huntington	0	---	---	0	---	4	0	---	0	0	---
Wheeling	0	---	0	0	4	2	0	0	0	13	20
North Carolina:											
Gastonia	0	---	---	0	---	0	0	---	0	2	---
Raleigh	0	---	0	0	0	0	0	0	0	0	9
Wilmington	0	---	0	1	5	0	0	0	0	0	21
Winston-Salem	0	1	0	0	1	4	0	0	0	3	8
South Carolina:											
Charleston	0	15	1	0	7	1	0	2	2	1	26
Florence	0	---	0	0	3	0	0	0	0	2	12
Greenville	0	---	0	0	2	0	0	0	0	0	7
Georgia:											
Atlanta	0	8	3	0	14	1	0	5	0	2	82
Brunswick	0	---	0	0	0	0	0	0	0	1	1
Savannah	2	4	1	0	0	1	0	3	1	1	32
Florida:											
Miami	0	3	2	1	0	2	0	2	0	0	40
Tampa	1	---	0	7	2	3	0	2	0	0	22
Kentucky:											
Covington	0	---	0	20	0	5	0	1	0	1	18
Lexington	0	---	0	5	3	0	0	2	0	0	21
Louisville	0	---	1	13	15	25	0	8	0	18	107
Tennessee:											
Knoxville	0	---	0	0	5	1	0	1	0	0	23
Memphis	0	---	2	11	11	2	0	6	0	33	69
Nashville	0	---	2	14	10	5	0	3	0	11	55
Alabama:											
Birmingham	1	14	3	4	5	1	0	5	0	5	72
Mobile	0	---	1	0	1	4	0	1	0	0	26
Montgomery	0	2	---	0	---	0	0	---	0	0	---
Arkansas:											
Fort Smith	1	---	---	0	---	1	0	---	0	2	---
Little Rock	0	---	0	1	1	0	0	0	3	0	2
Louisiana:											
Lake Charles	0	---	0	0	3	1	0	0	0	1	8
New Orleans	7	10	8	1	15	10	0	16	2	48	168
Shreveport	0	---	0	1	14	0	0	4	0	2	57

City reports for week ended Apr. 24, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Muskogee	0	--	--	0	--	0	0	--	0	0	--
Oklahoma City	0	12	2	0	10	7	0	0	0	4	44
Tulsa	0	--	--	1	--	6	0	--	0	3	--
Texas:											
Dallas	3	6	6	80	11	2	0	1	0	19	66
Fort Worth	0	--	0	29	9	8	0	0	0	6	--
Galveston	0	--	0	1	4	0	0	0	0	0	10
Houston	3	2	2	0	11	3	0	6	0	8	81
San Antonio	0	--	2	7	5	1	0	11	1	1	77
Montana:											
Billings	0	--	0	0	1	1	0	0	0	1	10
Great Falls	0	--	0	0	1	2	0	0	0	0	7
Helena	0	--	0	0	0	3	0	0	0	0	1
Missoula	0	--	0	0	3	0	0	0	0	0	4
Idaho:											
Boise	0	--	0	0	0	2	0	0	0	0	6
Colorado:											
Colorado Springs	1	--	0	0	1	5	0	1	0	0	10
Denver	8	--	1	4	5	20	0	8	0	46	77
Pueblo	0	--	1	0	1	3	0	0	0	0	9
New Mexico:											
Albuquerque	0	--	0	5	1	2	0	2	0	3	8
Utah:											
Salt Lake City	0	--	0	15	0	16	0	1	0	22	34
Washington:											
Seattle	0	--	3	2	6	3	1	3	0	64	103
Spokane	0	--	0	3	6	12	1	0	0	16	35
Tacoma	0	--	0	0	1	1	0	1	0	0	31
Oregon:											
Portland	0	--	0	2	1	16	5	2	0	6	83
Salem	0	2	--	1	--	0	0	--	0	0	--
California:											
Los Angeles	15	8	0	17	30	33	5	33	0	105	377
Sacramento	1	--	0	26	3	2	0	2	0	2	32
San Francisco	1	7	1	7	10	11	0	9	1	24	181

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	4	3	0
Springfield	0	1	0
Rhode Island:			
Providence	1	0	0
New York:			
New York	6	1	0
New Jersey:			
Newark	1	1	0
Pennsylvania:			
Pittsburgh	2	0	0
Ohio:			
Cleveland	1	1	0
Indiana:			
South Bend	0	1	0
Illinois:			
Chicago	1	3	0
Wisconsin:			
Milwaukee	1	1	1
Minnesota:			
St. Paul	1	0	0
Missouri:			
St. Joseph	1	0	0
Nebraska:			
Omaha	1	0	0
Maryland:			
Baltimore	2	1	0
District of Columbia:			
Washington	3	1	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Virginia:			
Richmond	0	1	0
North Carolina:			
Wilmington	4	1	0
South Carolina:			
Greenville	0	1	0
Florida:			
Miami	1	0	1
Kentucky:			
Louisville	3	0	0
Tennessee:			
Nashville	0	1	0
Alabama:			
Birmingham	9	0	0
Louisiana:			
New Orleans	2	0	0
Shreveport	0	1	0
Texas:			
Dallas	0	1	0
Fort Worth	0	1	0
Houston	1	0	0
Montana:			
Missoula	1	0	0
Colorado:			
Pueblo	1	0	0
Washington:			
Seattle	0	1	0
California:			
Los Angeles	2	2	1

Encephalitis, epidemic or lethargic.—Cases: New York, 4; Chicago, 1; Baltimore, 1; Birmingham, 1; Houston, 1.

Pellagra.—Cases: Charleston, S. C., 1; Savannah, 1; Miami, 1; Birmingham, 1.

Typhus fever.—Cases: New York, 1; Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 10, 1937.—During the 2 weeks ended April 10, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	3			1		5
Chicken pox		1	7	289	708	44	32	18	90	1,189
Diphtheria		4	1	34	25	4	1		1	70
Dysentery				9	3					12
Erysipelas				18	9	2	4	6	10	49
Influenza		133	2	929	80	174	17		306	1,641
Lethargic encephalitis				1	1					2
Measles		109	128	1,090	551	243	283	112	782	3,298
Mumps		3	205		722	15	42	45	72	1,104
Paratyphoid fever								1		1
Pneumonia		6			34		6		24	70
Poliomyelitis				2			1			3
Scarlet fever		21	16	139	273	82	85	82	34	732
Smallpox								1		1
Trachoma							6			6
Tuberculosis	6	11	15	131	107	16	35	7	28	356
Typhoid fever			3	19	8	1	1	1		33
Undulant fever			1	3	6		1		1	12
Whooping cough		4	1	277	152	50	36	13	34	567

NOTE.—Figures for Ontario include the 2 weeks ended April 17, 1937.

EGYPT

Infectious diseases—Second quarter 1936.—During the second quarter of 1936, certain infectious diseases were reported in Egypt, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2	1	Mumps	375	7
Cerebrospinal meningitis	58	50	Plague	22	13
Chicken pox	479	9	Puerperal septicemia	134	134
Dengue	2	1	Rabies	10	9
Diphtheria	304	125	Scarlet fever	24	2
Dysentery	676	147	Smallpox	1	
Erysipelas	1,408	290	Tetanus	97	70
Influenza	2,397	196	Tuberculosis (pulmonary)	1,362	636
Leprosy	61	21	Typhoid fever	1,128	285
Lethargic encephalitis	1	1	Typhus fever	1,420	217
Malaria	2,199	16	Undulant fever	8	
Measles	3,680	1,386	Whooping cough	812	61

Vital statistics—Second quarter 1936.—Following are vital statistics for the second quarter of 1936 in all places in Egypt having a health bureau:

Population	4,710,500	Deaths per 1,000 population	33.6
Live births	51,181	Deaths from diarrhea and enteritis under 2 years	11,845
Births per 1,000 population	43.5	Infant mortality per 1,000 births	246
Stillbirths	1,027		
Total deaths	39,625		

FINLAND

Communicable diseases—March 1937.—During the month of March 1937, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	286	Poliomyelitis	3
Influenza	5,685	Scarlet fever	1,241
Lethargic encephalitis	2	Typhoid fever	14
Paratyphoid fever	6		

IRISH FREE STATE

Vital statistics—Fourth quarter 1936.—The following statistics for the Irish Free State for the quarter ended December 31, 1936, are taken from the Quarterly Return of Marriages, Births, and Deaths, issued by the Registrar General, and are provisional:

	Number	Rate per 1,000 population		Number	Rate per 1,000 population
Marriages	3,357	4.5	Deaths from—Continued.		
Births	13,700	18.5	Influenza	135	0.18
Total deaths	10,253	13.8	Measles	47	
Deaths under 1 year of age	1,146	[1] 84	Puerperal septicemia	16	[1] 1.17
Deaths from:			Scarlet fever	53	
Cancer	898	1.21	Tuberculosis (all forms)	705	.95
Diarrhea and enteritis (under 2 years of age)	204		Typhoid fever	21	
Diphtheria	100		Whooping cough	59	

[1] Per 1,000 births.

Vital statistics—Year 1936.—The following vital statistics for the Irish Free State for the year 1936 are taken from the Quarterly Return of Marriages, Births, and Deaths issued by the Registrar General, and are provisional:

	Number	Rate per 1,000 population		Number	Rate per 1,000 population
Marriages	14,822	5.0	Deaths from—Continued.		
Births	58,020	19.6	Influenza	657	0.22
Total deaths	42,590	14.4	Measles	218	
Deaths under 1 year of age	4,271	[1] 74	Puerperal septicemia	90	[1] 1.55
Deaths from:			Scarlet fever	171	
Cancer	3,422	1.15	Tuberculosis (all forms)	3,360	1.13
Diarrhea and enteritis (under 2 years of age)	615		Typhoid fever	65	
Diphtheria	348		Typhus fever	1	
			Whooping cough	219	

[1] Per 1,000 births.

YUGOSLAVIA

Communicable diseases—4 weeks ended March 28, 1937.—During the 4 weeks ended March 28, 1937, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	15		Poliomyelitis		1
Cerebrospinal meningitis	58	20	Scarlet fever	249	4
Diphtheria and croup	602	67	Sepsis	16	9
Dysentery	18	1	Tetanus	20	10
Erysipelas	255	9	Typhoid fever	162	21
Measles	775	13	Typhus fever	142	21
Paratyphoid fever	10				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for April 30, 1937, pages 571–585. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 28, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India—Bombay.—During the week ended April 17, 1937, 1 imported case of cholera was reported in Bombay, India.

Plague

Bolivia—Potosi Department.—During the month of March 1937, 3 cases of pneumonic plague were reported in Potosi Department, Bolivia.

China—Amoy.—During the week ended April 10, 1937, 1 imported case of pneumonic plague was reported in Amoy, China.

Hawaii Territory—Hawaii Island—Hamakua District—Paauhau Sector.—Two rats found on April 28, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been proved plague-infected.

Smallpox

India—Cochin.—During the week ended April 10, 1937, 47 cases of smallpox were reported in Cochin, India.

Mexico.—During the month of February 1937, smallpox was reported in Mexico as follows: Aguascalientes, Aguascalientes State, 1 case, 1 death; Colima, Colima State, 2 cases; Guadalajara, Jalisco State, 1 case; Mexico, D. F., 9 cases and 2 deaths; Monterrey, Nuevo Leon State, 6 cases; San Luis Potosi, San Luis Potosi State, 1 case.

Typhus Fever

Mexico.—During the month of February 1937, typhus fever was reported in Mexico as follows: Aguascalientes, Aguascalientes State,

3 cases; Mexico, D. F., 18 cases, 6 deaths; Oaxaca, Oaxaca State, 2 cases; Puebla, Puebla State, 3 cases; Queretaro, Queretaro State, 2 cases.

Syria.—During the week ended April 10, 1937, 1 case of typhus fever was reported in Syria.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Xapury, Acre Territory, January 18, 1 death. Minas Geraes State—Alfenas, March 15, 1 death, March 19, 1 death; Arary, March 25, 1 death; Areado, March 21, 1 death; Cambuquira, March 20, 1 death (first appearance); Campos Geraes, March 20, 1 death; Carmo de Cachoeira, March 15, 1 death (first appearance); Conceicao da Apparecida, March 18, 1 death; Espirito Sto. de Prata, March 17, 1 death (first appearance); Fama, March 17, 1 death (first appearance); Itumirin, March 23, 1 death (first appearance); Jacuhy, March 20, 1 death; Nepomúceno, March 23, 1 death; Prados, March 26, 1 death (first appearance); St. Sebastiao do Paraizo, March 25, 1 death.

Senegal—Sine Saloum Subdivision—Diakhao.—On April 28, 1937, 1 fatal case of yellow fever was reported in Diakhao, Sine Saloum Subdivision, Senegal.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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A STRAIN OF ENDEMIC TYPHUS FEVER ISOLATED FROM A FIELD MOUSE *

By George D. Brigham, *Senior Medical Technician, United States Public Health Service*

In 1934, Baker, McAlpine, and Gill (*1*) reported that, in southern Alabama, endemic typhus had spread from the urban to the rural districts, and Rumreich (*2*) noted cases in the same section which developed under conditions which made the rat a "highly improbable causative factor." In view of these reports, studies were undertaken in Alabama to determine what species of native rodents were susceptible to typhus and might possibly serve as reservoirs of the virus. At the same time, work was inaugurated to recover the virus from animals, chiefly rodents, trapped on rural premises in typhus-infected districts.

We have previously reported on the susceptibility of various species of native rodents (*3*) (*4*), and in the present paper are able to report the recovery of endemic typhus virus from an old-field mouse (*Peromyscus polionotus polionotus*). This mouse was trapped on rural premises in the southeastern part of Alabama in the fall of 1936. Its brain was removed, and half of it was injected, intraperitoneally, into each of two guinea pigs.

Both guinea pigs showed a febrile reaction on the 6th day, and scrotal involvement on the 8th day after inoculation. By transfer of blood and testicular washings from one of these guinea pigs, the strain was established and has been maintained to date. This strain has been passed through 22 generations, 90 guinea pigs being used. Of these animals, 77 gave a typical clinical picture of uncomplicated typhus, 6 showed fever with slight scrotal involvement, and 2 showed fever only. Five died with intercurrent infections. A comparison between the stock Wilmington strain of endemic typhus and this wild-mouse strain shows the two to be similar in all respects.

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* Contribution from the Typhus Research Laboratory, Mobile, Ala.

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SUSCEPTIBILITY OF ANIMALS TO ENDEMIC TYPHUS FEVER*

By GEORGE D. BRIGHAM, *Senior Medical Technician, United States Public Health Service*

Several species of animals native to the United States have previously been reported as susceptible to endemic typhus—the woodchuck, meadow mouse, white-footed mouse, and opossum (*1*, *2*). To this list may now be added, three species of field mice, three species of native rats, and a species of flying squirrel. In addition, a cat was found susceptible, confirming earlier observations by Lépine (*3*), and nine raccoons were found insusceptible.[1] All of the animals used in these experiments were trapped in southern Alabama.

To determine the susceptibility of these animals, the same general procedure was used in all cases. Each animal was inoculated intraperitoneally with the testicular washings from a guinea pig at a routine transfer of the stock Wilmington strain of endemic typhus. After a period of time, the animal was killed, and the brain was removed and inoculated into guinea pigs. Each strain recovered was studied in a number of guinea pigs to identify it by its clinical reaction, brain lesions,[2] and cross immunity with a known typhus strain, and for the presence of rickettsia. Rabbits were inoculated for the production of agglutinins for *Proteus* OX19.

The strains of typhus recovered from the above animals showed no differences, when compared in guinea pigs, from the original Wilmington strain.

MICE

Three old-field mice (*Peromyscus polionotus polionotus*) were inoculated with endemic typhus. The virus was recovered from all three mice. One mouse appeared ill on the seventh day after inoculation and was killed on the tenth day. One was active until found dead on the twelfth day, and the third was killed on the thirteenth day because both hind legs were paralyzed at that time.

A cotton mouse (*Peromyscus gossypinus gossypinus*) and a golden mouse (*Peromyscus nuttalli aureolus*) were inoculated with endemic typhus virus. Neither of these animals showed any gross signs of infection, retaining their activity until killed. The cotton mouse

*Contribution from Typhus Research Laboratory, Mobile, Ala.

[1] All of the rodents were identified through the courtesy of the National Museum.

[2] All examinations were made by Dr. Lillie, National Institute of Health, Washington, D. C.

was killed 18 days and the golden mouse 14 days after inoculation. The virus was recovered from both mice.

RATS

One member of each of the following species of rats was inoculated with typhus: Wood rat (*Neotoma floridana rubida*), cotton rat (*Sigmodon hispidus hispidus*), and rice rat (*Oryzomys palustris palustris*). All of these rats were very active until killed. The wood and rice rats were killed 14 days and the cotton rat 18 days after inoculation. The virus was recovered from all rats.

FLYING SQUIRREL

A flying squirrel (*Glaucomys volans saturatus*) was injected with the virus. In this animal no sign of illness was observed. The virus was recovered from the brain 14 days after inoculation.

CAT

A kitten (*Felis domesticus*) was inoculated with the virus. Daily temperatures were recorded, and there developed on the 3d day after inoculation a febrile reaction which continued for 4 days. The cat showed signs of illness, with loss of appetite, on the 10th, 11th, and 12th days. The virus was recovered from the heart blood obtained on the 7th day and from the brain removed on the 14th day after inoculation.

RACCOON

A young raccoon (*Procyon lotor lotor*) weighing 1,230 grams was inoculated with the virus. Daily temperatures were recorded, with no febrile reactions obtained. The animal was always exceedingly active. No strain was recovered from the brain removed 14 days after inoculation. Previously, in Montgomery,[3] Ala., it had been found that eight raccoons of varying ages were not susceptible to endemic typhus.

SUMMARY

The following animals trapped in Alabama were found to be susceptible to the virus of endemic typhus fever: Oldfield mice, cotton mice, golden mice, cotton rats, rice rats, wood rats, flying squirrels, and cats. Raccoons were not found susceptible.

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STUDIES IN CHEMOTHERAPY

IV. COMPARATIVE STUDIES OF SULPHONAMIDE COMPOUNDS IN EXPERIMENTAL PNEUMOCOCCUS, STREPTOCOCCUS, AND MENINGOCOCCUS INFECTIONS[1]

By SANFORD M. ROSENTHAL, *Senior Pharmacologist;* HUGO BAUER, *Research Associate;* and SARA E. BRANHAM, *Senior Bacteriologist, National Institute of Health, United States Public Health Service*

In a previous communication para-aminobenzene sulphonamide was shown to exert a favorable influence on pneumococcus infections in mice (*1*). Experiments are herein reported on this compound in pneumococcus infections in rats and rabbits. Work is in progress to obtain more effective chemicals, and some comparative results with other compounds in pneumococcus, streptococcus, and meningococcus infections are also dealt with in the present paper.

PARA-AMINOBENZENE SULPHONAMIDE[2] IN PNEUMOCOCCUS INFECTIONS OF RATS AND RABBITS

For this purpose the same strains of pneumococci were employed that were used in mice; they were obtained from the Mulford Biological Laboratories. The type I strain was almost equally virulent for mices rats, and rabbits, thereby giving a basis for comparative results in the three species. The type III strain was also highly virulent for rats (10^{-5}) while the type II strain was of lowered virulence for rats (10^{-3}); in rabbits, types II and III strains were of a virulence too low to be used, and we have not yet attempted to increase their virulence by animal passage. In these experiments the dosage of organisms was adjusted so that 10 to 100 fatal doses were employed, as in the mouse experiments. The sulphanilamide was administered in doses near the maximum dose that could be tolerated without symptoms. For rats and rabbits this proved to be approximately half the dosage, on a basis of body weight, that could be used in mice. Therapy was given subcutaneously within 30 minutes after the animals had been inoculated intraperitoneally with 1 cc to 1.5 cc of diluted broth cultures of the organisms.

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[1] From the Divisions of Pharmacology and Biologics Control.

[2] This compound will subsequently be referred to as sulphanilamide, the name adopted by the Council on Pharmacy and Chemistry of the American Medical Association. It can be obtained from Merck & Co., E. R. Squibb & Sons, Burroughs & Wellcome, and from the Winthrop Chemical Co. under the name Prontylin.

In rats the curative action of sulphanilamide was quite marked.[3] Seventy percent of the treated animals survived the type I infection, while 100 percent survived the type II and type III infections. With the exception of one animal (III) the survivors have remained permanently well (fig. 1). In these experiments upon rats the effectiveness of sulphanilamide compares favorably with the results obtained in streptococcal infections in other animals.

With type I infection the results in rabbits were closer to those obtained with mice. While there was uniform prolongation of life, only 25 percent of the animals survived as a result of therapy (fig. 2).

We have not yet obtained compounds more effective than sulphanilamide in pneumococcus infections. While we have a compound

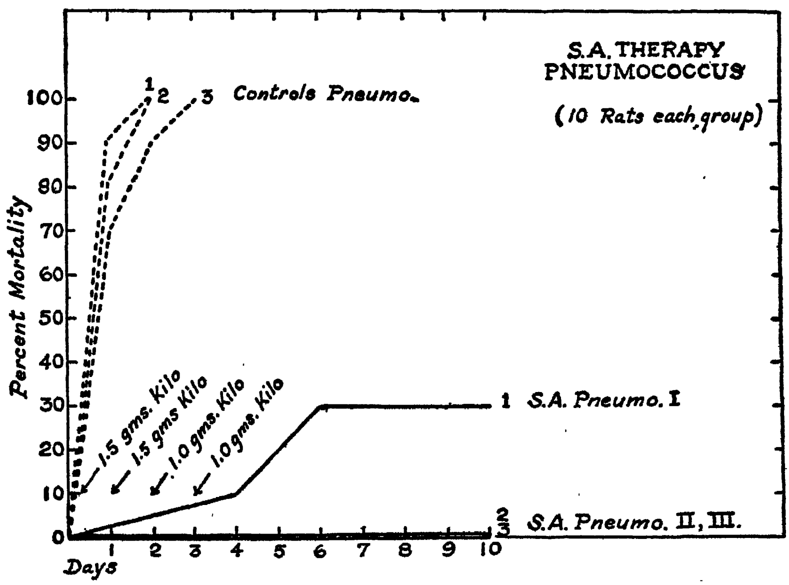


FIGURE 1.—The action of sulphanilamide in pneumococcus infections in rats. One cc of broth culture of Mulford type I pneumococcus, diluted 10^{-6}; type II, 10^{-2}; type III, 10^{-4}, intraperitoneally. Drug subcutaneously as indicated at arrows.

(di-sulphanilamide) with a better therapeutic index in streptococcus and meningococcus infections, this compound was less effective against pneumococci in rats and mice (fig. 3). Other compounds possessing little activity against pneumococci were also p-aminobenzene sulphonanilide, p-aminobenzene sulphonamide formaldehyde sulfoxylate, and p-benzyl aminobenzene sulphonamide. Other related compounds with little or no effect upon pneumococci have been reported in a previous communication (*1*).

[3] Since this was written, good results with type III pneumococcus in rats have been reported by Gross and Cooper. (Proc. Soc. Exp. Biol. and Med., 36 : 225 (1937)).

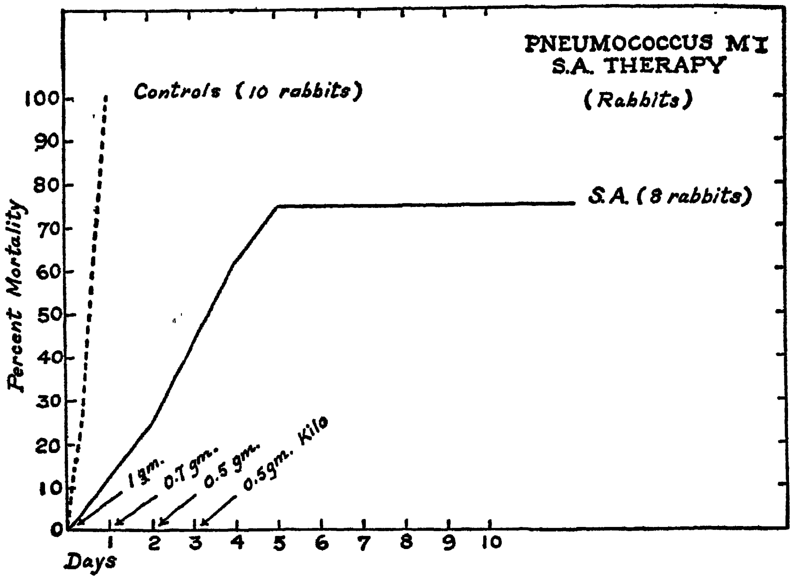


FIGURE 2.—Sulphanilamide therapy of type I pneumococcus in the rabbit. Infecting dose of organisms 1.5 cc of 10^{-4} intraperitoneally. Drug subcutaneously as indicated.

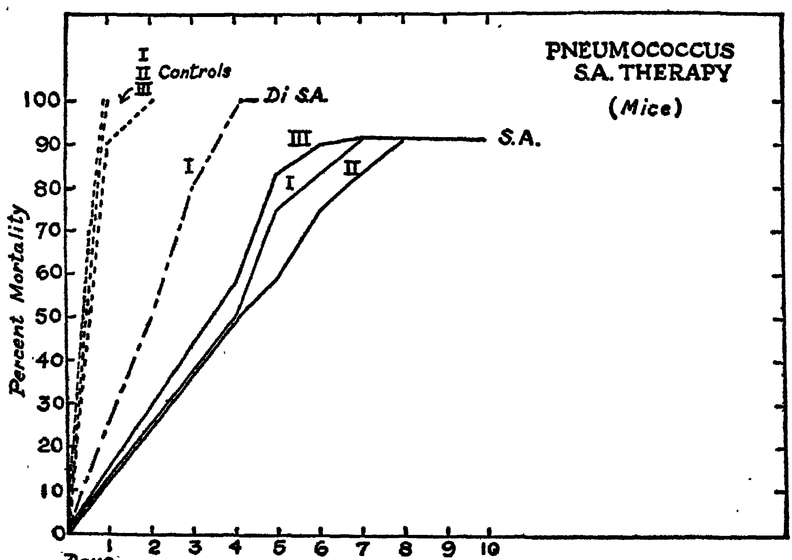
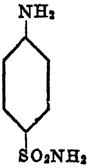


FIGURE 3.—Sulphanilamide and di-sulphanilamide therapy of pneumococcus infections (Mulford strains) in mice. Results with S. A. from a previous report (*1*). Di-S.A. given 4.0 gm per kilo 1st day, 2.0 gm per kilo 2nd and 3rd days (10 mice).

Chemical relationship of sulphonamide compounds employed.—These can be considered as substitution products of sulphanilamide, which is

(A)



(B)

Compounds substituted at the free amino group (A) include:

p-aminobenzene sulphonamide formaldehyde sulphoxylate,[4] $SO_2NH_2C_6H_4.NHCH_2SO_2Na$

p-benzyl aminobenzene sulphonamide[5]. This compound was first prepared and studied by Goissedet and collaborators *(8)*: $SO_2NH_2C_6H_4NHCH_2C_6H_5$.

Prontosil[6], 4-sulphonamide-2, 4′ diaminobenzene.

Prontosil soluble[6], 4-sulphonamide-phenyl-2-azo-7-acetylamino-1-hydroxy-naphthalene-3-6,-disulphonic acid.

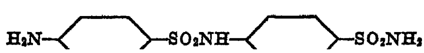
Compounds substituted at the sulphonamide radical (B) include:

p-aminobenzene sulphoneanilide, originally studied by Buttle, Gray and Stephenson *(4)*: $H_2NC_6H_4SO_2NHC_6H_5$.

p-aminobenzene sulphonyl p-aminobenzene sulphonamide[3], which we have called di-sulphanilamide, is

$$NH_2C_6H_4SO_2NHC_6H_4SO_2NH_2.$$

This compound is prepared by condensing acetyl aminobenzene sulphonyl chloride with sulphanilamide, and subsequently deacetylating. The structural formula is



Di-sulphanilamide is of low solubility in cold water (0.01 percent) but much more soluble in hot water. The acetyl derivative of this compound was prepared by Fourneau and collaborators *(9)*, who found it feebly active against streptococci. No previous work has been reported with the deacetylated compound.

COMPARATIVE RESULTS WITH SULPHONAMIDE COMPOUNDS IN STREPTOCOCCAL INFECTIONS

Comparison was made against streptococcal infections in mice with Prontosil, Prontosil Soluble, sulphanilamide, and new compounds which we have prepared. Mice were injected subcutaneously

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[4] New compounds, prepared for the first time by Dr. Bauer.

[5] Obtained from Merck & Co.

[6] Obtained from Winthrop Chemical Co.

with aqueous solutions of Prontosil Soluble and with suspensions in olive oil of the other compounds. The strain of streptococcus was one isolated from erysipelas and was highly virulent for mice. The intraperitoneal injection of 0.5 cc of an 18-hour broth culture diluted 10^{-9} killed the majority of animals within 48 hours. Approximately 1,000 fatal doses were employed (10^{-6}), and treatment by subcutaneous injection was begun within one-half hour after infection.

With 0.5 gram per kilo of sulphanilamide repeated daily for 3 days, 80 percent of survivors were obtained. With 0.25 gram per kilo inferior results were secured. Prontosil and Prontosil Soluble were administered on a molar basis so that the same quantity of sulphona-

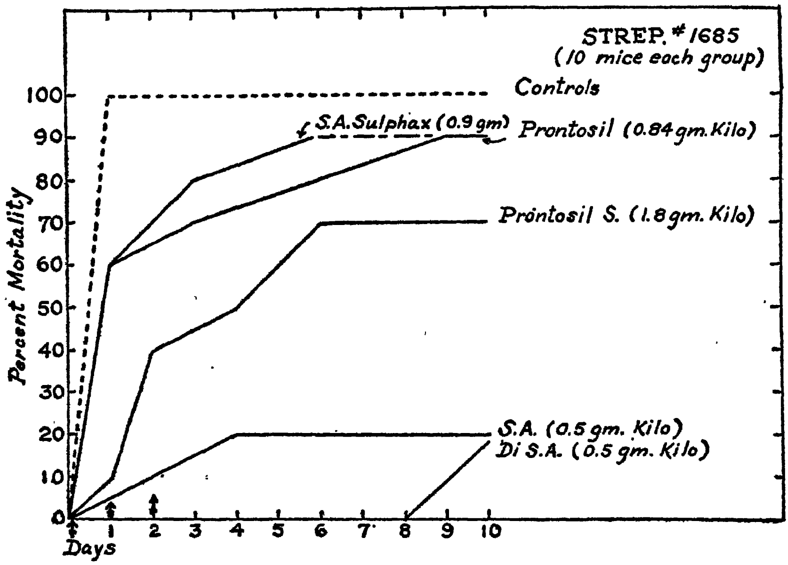

FIGURE 4.—Comparison of sulphonamide compounds in streptococcal infection in mice. Dosage is shown on chart and time of subcutaneous injection is indicated by arrows.

mide radical was injected. With Prontosil (0.84 gram per kilo) and with p-aminobenzene sulphonamide formaldehyde sulphoxylate (0.9 gram per kilo) there were 10 percent of survivors; with Prontosil Soluble (1.8 gram per kilo) there were 30 percent of survivors. With di-sulphanilamide, half of the molar amount was used (0.5 gram per kilo) and 80 percent of the mice survived (fig. 4). With 0.25 gram per kilo inferior results were secured.

Toxicity experiments in mice showed the maximum dose of sulphanilamide that could be tolerated without symptoms, when injected in oil or given by mouth, to be 1.5 gram per kilo. (Some mice develop ataxia and spasticity with this dosage.) Similar experiments with di-sulphanilamide revealed that no symptoms were produced with 8 grams per kilo (table 1). This compound therefore possesses a thera-

peutic index at least 5 times as favorable as sulphanilamide. This applied only to subcutaneous injection; for, upon oral administration, di-sulphanilamide was less effective than sulphanilamide against streptococci (fig. 5). Di-sulphanilamide is of low solubility, and poor absorption from the alimentary canal may account for its lowered activity by mouth.[7]

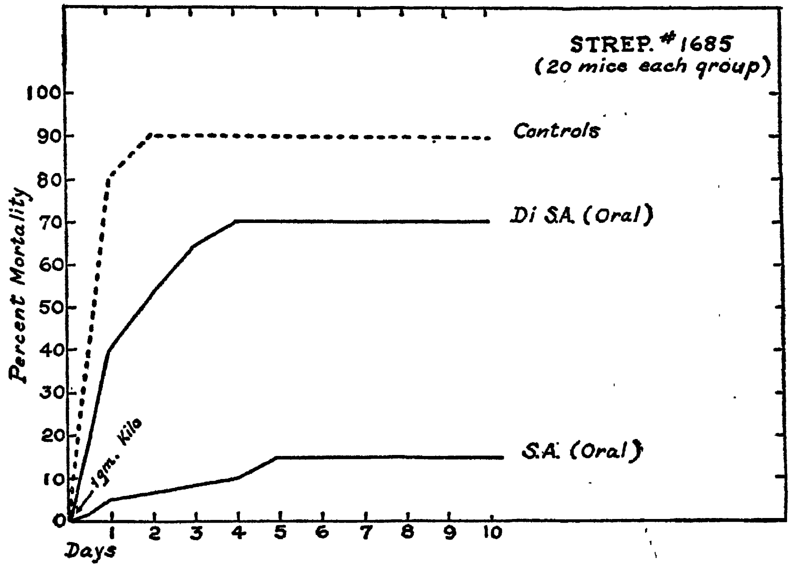

FIGURE 5.—The effectiveness of di-sulphanilamide is decreased when administered by mouth.

TABLE 1.—*Toxicity in mice following single subcutaneous injections in olive oil of sulphanilamide and di-sulphanilamide (10 mice in each group, with the exception of the lowest dosage, where frequent observations were made upon mice under treatment)*

Dosage	Sulphanilamide	Di-sulphanilamide
Grams per kilo:		
1.5	Spasticity, ataxia (occasional)	No symptoms.
3.0	Spasticity, ataxia, convulsions, 10 percent mortality	Do.
4.0	Spasticity, ataxia, convulsions, 40 percent mortality	Do.
6.0	75 percent mortality	Do.
8.0		Do.

We have conducted some experiments on the excretion of Prontosil Soluble in rabbits. This compound is excreted with great rapidity, and we were able to recover from 85 to 95 percent in the urine within 5 hours after intramuscular or intravenous injection (fig. 6). From 4 to 8 percent was recovered within 2 hours from the bile of rabbits. This rapid excretion is disadvantageous to chemotherapeutic action, since effective concentrations are not maintained in the body for any length of time. Indeed, if it is true as suggested by Fuller (*2*) and by

[7] Work is in progress to obtain more soluble derivatives.

Long and Bliss (*3*) that this drug, to be chemotherapeutically active, must be reduced in the body to liberate the sulphanilamide radical, then a surprisingly small percentage of the amount injected is retained in the body to be so activated. However, the excretion of so much of this compound in unchanged form suggests that some of the therapeutic activity may reside in the intact molecule.

It occurred to us that if Prontosil Soluble were administered orally, excretion would be delayed and a greater part of this drug would be reduced in the alimentary canal and in the body, so that more of the active component would be liberated. This was borne out in two series of experiments on mice infected with streptococci. Identical doses of Prontosil Soluble given orally and subcutaneously showed the

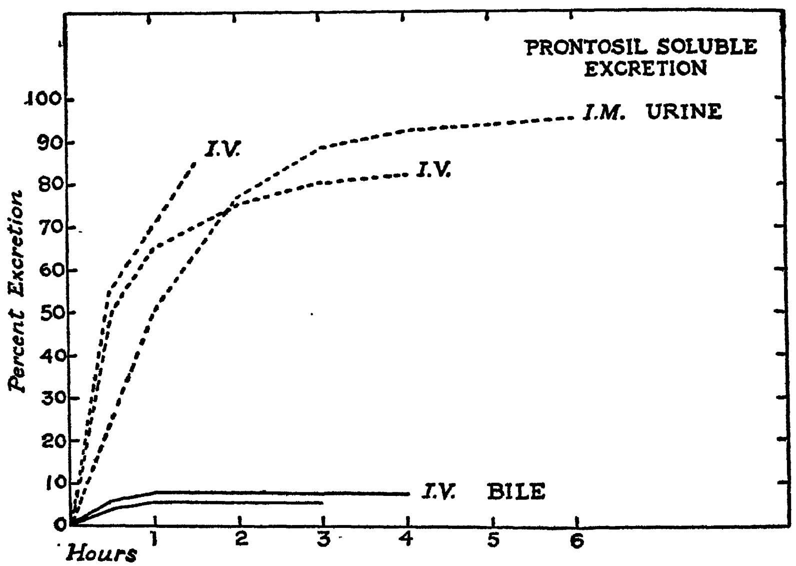

FIGURE 6.—The excretion of Prontosil Soluble in the urine and bile of rabbits. One cc and 2 cc injected intravenously (i. v.) and 2 cc injected intramuscularly (i. m.), 2.5 percent solution.

drug to be more effective on oral administration than when injected (fig. 7).

p-aminobenzene sulphonanilide was reported by Buttle, Gray, and Stephenson (*4*) to be as active as sulphanilamide against streptococci. We have found it to be approximately half as active by weight, which means that, on a molar basis, their effectiveness would be quite similar.

SULPHONAMIDE COMPOUNDS IN MENINGOCOCCUS INFECTIONS IN MICE

The curative action of sulphanilamide in meningococcus infections in mice was first reported by Buttle, Gray, and Stephenson (*4*), and their findings were elaborated upon by Proom (*5*). Curative results

were obtained by them against as many as a million lethal doses of meningococci when therapy was instituted immediately after infection. We have obtained similar results, and work is in progress on the effect of this compound upon various types of meningococci, as well as on the relative merits of serum and drug therapy. In the present paper comparative results will be given for various sulphonamide compounds which we have studied. The meningococci used in these studies were recently isolated strains of high virulence, and the size of the dose given was determined in preliminary tests.

Mice infected with such strains become severely ill in a very short time, and the majority of deaths in untreated animals occur within 24 hours. The course of meningococcus infection in mice has been

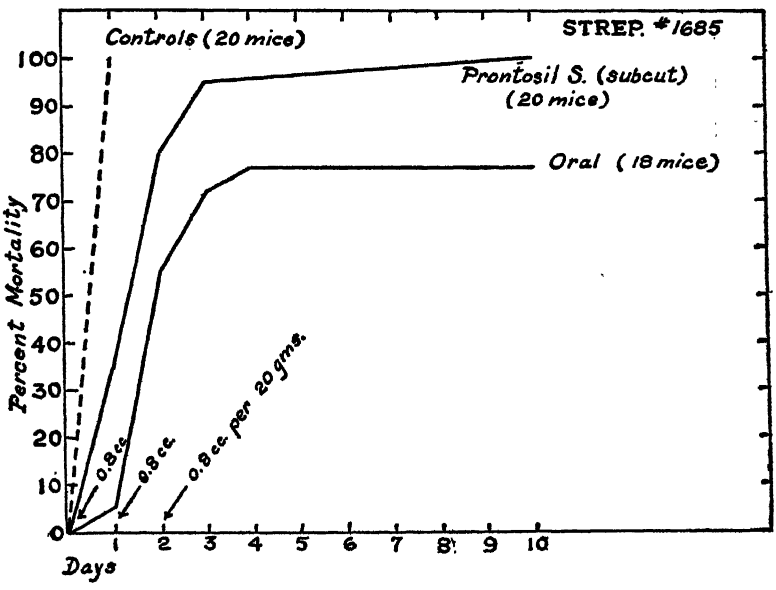

FIGURE 7.—Prontosil Soluble is more effective by mouth than subcutaneously in streptococcal infections in mice. The same dosage used in both cases, at intervals indicated on chart.

accurately described by Miller (*6*). Very few animals die if they can survive the infection 48 hours. For the present study, only one injection of drug was employed, given within one-half hour after intraperitoneal inoculation of the organisms suspended in mucin, following the technique of Miller (*6*, *7*). While this amount of therapy does not represent maximum curative results, it was satisfactory for comparison of different drugs. All drugs were administered subcutaneously and were suspended in olive oil, with the exception of those which were water-soluble (Prontosil Soluble and p-aminobenzene sulphonamide formaldehyde sulphoxylate).

Results obtained were similar to those obtained with streptococci. The greatest percentage of survivors occurred following disulphanil-

amide therapy (fig. 8). In a group of three experiments in which a total of 40 mice were given 0.5 gram per kilo of di-sulphanilamide the average mortality was 10 percent. In the same experiments among 40 mice receiving 0.5 gram per kilo of sulphanilamide the mortality was 30 percent. (Two of the experiments are shown in fig. 8.)

Under the conditions of these experiments the maximum results with sulphanilamide were obtained with dosages between 0.5 and 1.0 gram per kilo. The animals were so acutely ill as a result of the inoculation of meningococci that larger doses of this drug caused frequent deaths.

Less favorable results were obtained with Prontosil and Prontosil Soluble, even though the former was employed on a molar ratio (0.84

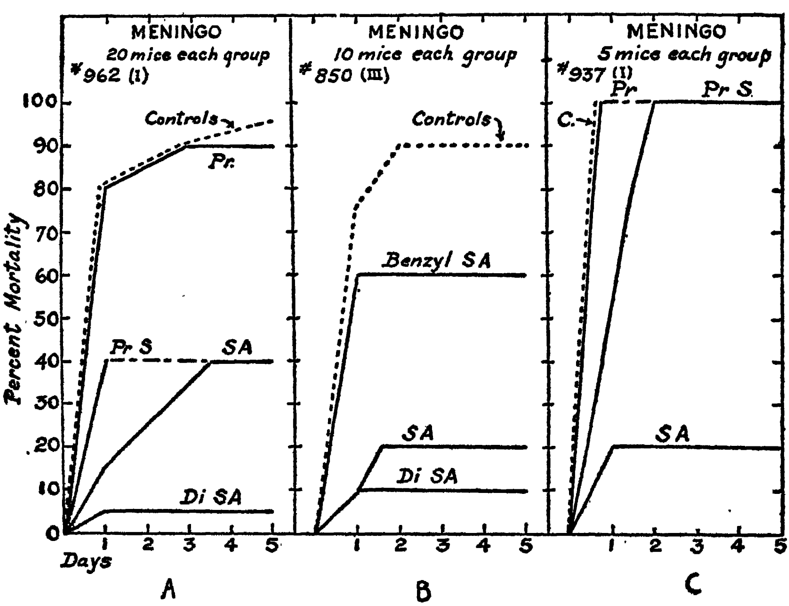

FIGURE 8.—Comparison of sulphonamide compounds upon meningococcal infections in mice. Therapy consisted of one injection of drugs within one-half hour after infection. Dosages were as follows: (A) 0.5 gm per kilo for S. A. and Di-S. A.; 0.84 gm per kilo for Prontosil; 1.25 gm per kilo for Prontosil Soluble. (B) 0.5 gm per kilo in each case. (C) S. A. and Prontosil Soluble, 1.25 gm per kilo. Prontosil, 2 gm per kilo.

gram per kilo). Prontosil Soluble was available only as 2.5 percent solution and so the maximum volume injectable into a mouse at one time (1.0 cc, 1.25 gram per kilo) was used (fig. 8).

Benzyl p-aminobenzene sulphonamide (0.5 gram per kilo) gave a fair percentage of cures, although inferior to sulphanilamide and di-sulphanilamide. This compound is also of low toxicity, 6 grams per kilo producing no symptoms when injected subcutaneously in oil into mice. p-aminobenzene sulphonamide formaldehyde sulphoxylate and p-aminobenzene sulphonanilide were of inferior activity against meningococci

SUMMARY

Upon the same strains of pneumococci, sulphanilamide was much more effective in rats than in mice and rabbits. Up to the present time no other compounds have been found as effective against pneumococcus infections as sulphanilamide.

A new compound has been prepared, di-sulphanilamide, which, on subcutaneous administration, was slightly more effective against streptococcic infections in mice, while at the same time its acute toxicity is less than one-fifth as great as that of sulphanilamide. Prontosil, Prontosil Soluble, and other compounds were less effective.

Prontosil Soluble was more effective by mouth than by subcutaneous administration, owing to its rapid excretion in the urine when injected parenterally.

Upon meningococcic infections in mice, di-sulphanilamide administered subcutaneously was more effective than sulphanilamide. Prontosil, Prontosil Soluble, and other derivatives were found less effective.

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AIRPLANE COMPANY INSTITUTES MEASURES AGAINST YELLOW FEVER

In the fight against communicable diseases it frequently happens that control measures are developed which are entirely adequate for the time being, but later new conditions arise which make additional protective measures necessary.

Before it was known that yellow fever was transmitted by the mosquito, this country was subjected to frightful ravages by this disease, some of which occurred less than half a century ago. After the epoch-making investigations and discoveries by Dr. Walter Reed and other medical officers of the United States Army, later confirmed and amplified by other workers in this country and abroad, and the subsequent application of their contributions to the knowledge of the epidemiology of the infection, yellow fever became a vanishing disease and was soon entirely eliminated from North America and from the ports of the entire Western Hemisphere. However, with the presence

of jungle yellow fever in South America, the possibility of an animal reservoir and of the existence of yet unknown vectors of the disease in nature, and with the quick passage of airplanes from South American countries where this type of yellow fever persists, the possibility of the reintroduction of the disease into North America becomes something of more than mere academic interest.

A note was recently published in the PUBLIC HEALTH REPORTS [1] showing that in 24 of 69 inspections of airplanes arriving at Miami, Fla., from South American ports, 53 insects were captured and 1 escaped. In 7 of these 24 inspections, 13 mosquitoes were found. While no yellow-fever mosquitoes (*Aëdes aegypti*) were discovered, the possibility of their importation is evident.

Under date of April 21, 1937, Medical Director J. D. Long, of the Public Health Service, reports that the Pan American Airways, Inc., has instituted the following control measures:

1. All flying personnel not already vaccinated against yellow fever will be vaccinated here in Rio de Janeiro at the Rockefeller laboratory. This will be begun at once, and will be finished as soon as may be possible. The flying personnel will include aviators, radio operators, flying mechanics, pursers, stewards, etc.
2. Beginning May 1, 1937, cards will be filled out for all passengers which will show where they have been or have resided for the six (6) days just prior to embarking en route to the United States. These cards will be attached to the passenger list of the airplane and will be available to the Quarantine Officer on arrival at destination.

With such cooperation, the Public Health Service may pursue its efforts to eliminate this new hazard with every prospect of success and without unduly restricting the utilization of our newest and fastest means of transportation.

STANDARDIZATION OF ANTIPNEUMOCOCCUS HORSE SERA AND CONCENTRATES

A report [2] on the standardization of antipneumococcus sera and concentrates recently issued by the Public Health Service, includes the description of a modified mouse-protection test, of an in-vitro combining equivalent technique, and a report of the findings of unit value in the United States control serum P11 and the British dried standard sera for types I and II.

Reliable and reproducible results may be obtained in the mouse-protection test for assay of type I and type II antipneumococcus sera under the following conditions: When the test employs dilutions of both culture and antibody which lie in the zone in which the law of

[1] Apr. 2, 1937, p. 414.

[2] By Lloyd D. Felton and H. J. Stahl. National Institute of Health Bulletin No. 169. Government Printing Office, Washington, D. C., 1937.

multiple proportions is valid; when culture dose is standardized against 0.5 unit of antibody; when the mice used are of uniform resistance; and when the unknown serum is tested in comparison with 0.5 unit of a standardized control serum.

An in-vitro method of assay, a "combining equivalent" test, is based on the principle of measuring the amount of antibody which actually combines with the soluble specific substance. This method was briefly described in the Public Health Reports for December 6, 1935. This test shows a high degree of correlation with the mouse-protection test described; i. e., in 62 samples, the correlation coefficient, r, $= 0.94$ for type I and 0.91 for type II sera.

By comparison with serum F146 in 1933, the National Institute control serum P11 was found to contain, by mouse-protection method, 300 type-I and 131 type-II units per cc; by neutralization method, 333 type-I and 150 type-II units per cc; by the combining equivalent method, 322 type-I and 150 type-II units per cc; and by Heidelberger's method, 308 type-I and 150 type-II units per cc.

In 1935 a comparison of serum F146 and the dried British standards with Lyo–P11 demonstrated a deterioration of serum F146, and gave the following unit content of the British sera: Mouse-protection method, 1,150 type-I and 750 type-II units; combining equivalent method, 1,177 type-I and 720 type-II units; and by Heidelberger's method, 949 type-I and 426 type II-units per cc.

DEATHS DURING WEEK ENDED MAY 1, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 1, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	8,859	9,480
Average for 3 prior years	8,977	
Total deaths, first 17 weeks of year	169,289	165,103
Deaths under 1 year of age	504	582
Average for 3 prior years	620	
Deaths under 1 year of age, first 17 weeks of year	10,427	10,011
Data from industrial insurance companies:		
Policies in force	69,704,534	68,511,026
Number of death claims	14,151	14,293
Death claims per 1,000 policies in force, annual rate	10.6	10.9
Death claims per 1,000 policies, first 17 weeks of year, annual rate	11.4	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 8, 1937, and May 9, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936
New England States:								
Maine	1	1		3	28	134	0	0
New Hampshire					81	82	0	0
Vermont	1	1				545	0	0
Massachusetts	6	7			683	1,407	12	7
Rhode Island	1				218	76	3	3
Connecticut	6	6	1	3	373	249	0	5
Middle Atlantic States:								
New York	41	73	[1] 7	[1] 8	1,507	3,892	9	25
New Jersey	7	9	10	14	1,989	567	3	8
Pennsylvania	34	21			1,135	1,114	9	9
East North Central States:								
Ohio	9	20	11	65	1,015	333	5	9
Indiana	3	6	16	40	771	23	1	10
Illinois	27	25	39	54	274	43	7	9
Michigan	8	5	3	5	169	113	3	3
Wisconsin	3	1	68	37	23	130	0	2
West North Central States:								
Minnesota	3	1	2	2	15	456	4	2
Iowa	2	7	6	31	2	3	0	3
Missouri	4	16	65	207	12	41	0	8
North Dakota			2	18			0	0
South Dakota	1				2	4	1	0
Nebraska		2			76	20	2	0
Kansas	2	10	4	48	27	22	2	2
South Atlantic States:								
Delaware		1			61	19	0	0
Maryland [3]	13	2	12	12	550	429	6	10
District of Columbia	5	16		1	103	187	1	1
Virginia [3]	18	18		147	490	256	9	11
West Virginia	9	8	21	27	58	76	9	7
North Carolina	8	19	31	28	152	43	4	8
South Carolina	3	6	211	142	55	76	1	4
Georgia [4]	3	4					2	2
Florida	3	3		8	14	29	1	4
East South Central States:								
Kentucky	5	9	16	101	445	27	7	9
Tennessee	14	6	80	160	84	29	7	7
Alabama [4]	6	13	174	128	25	16	10	1
Mississippi [3]	3	5					5	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 8, 1937, and May 9, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936
West South Central States:								
Arkansas	3	6	66	169	2	1	0	0
Louisiana	14	11	16	310	6	63	1	2
Oklahoma [1]	12	5	74	247	79	26	4	1
Texas [4]	57	28	365	498	1,070	450	5	4
Mountain States:								
Montana	1	6		2	27		0	1
Idaho [3]			3	6	24	11	0	0
Wyoming [3]		2			4	2	0	0
Colorado [3]	5	3			17	26	0	1
New Mexico	3	2		26	111	38	1	1
Arizona	1	1	32	35	169	116	0	1
Utah [2]					29	12	0	2
Pacific States:								
Washington	2	1	1	3	47	330	8	2
Oregon [3]		2	25	14	6	138	0	0
California [4]	48	23	50	163	265	1,914	1	9
Total	395	411	1,411	2,757	12,293	13,568	138	193
First 18 weeks of year	8,872	9,870	208,019	130,929	140,252	178,185	2,996	4,385

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936
New England States:								
Maine	0	0	20	9	0	0	1	8
New Hampshire	0	0	17	13	0	0	0	1
Vermont	0	0	13	5	0	0	0	0
Massachusetts	1	2	256	246	0	0	2	1
Rhode Island	0	0	62	19	0	0	0	6
Connecticut	0	0	159	40	0	0	0	2
Middle Atlantic States:								
New York	1	1	979	904	0	0	7	12
New Jersey	0	1	188	328	0	0	1	0
Pennsylvania	0	2	894	381	0	0	6	16
East North Central States:								
Ohio	0	0	255	288	0	0	6	4
Indiana	0	0	150	180	23	4	1	0
Illinois	1	0	618	575	19	18	2	6
Michigan	0	1	709	283	3	0	0	4
Wisconsin	0	1	296	546	3	6	0	0
West North Central States:								
Minnesota	0	1	132	314	25	7	0	2
Iowa	0	0	189	203	26	62	1	4
Missouri	0	0	192	205	25	1	8	1
North Dakota	0	0	15	63	33	8	3	0
South Dakota	0	0	46	16	1	19	0	0
Nebraska	0	0	68	101	4	21	0	0
Kansas	0	0	244	296	15	38	2	1
South Atlantic States:								
Delaware	0	0	9	3	0	0	0	0
Maryland [2]	0	0	53	46	0	0	1	2
District of Columbia	0	0	13	17	0	0	0	1
Virginia [3]	0	1	13	49	0	0	5	0
West Virginia	0	0	46	32	0	0	1	4
North Carolina	1	2	31	23	0	0	0	8
South Carolina	0	0	2	4	0	0	2	8
Georgia [4]	0	0	8	7	0	0	5	9
Florida	0	0	10	7	0	0	0	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 8, 1937, and May 9, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936	Week ended May 8, 1937	Week ended May 9, 1936
East South Central States:								
Kentucky	0	0	45	23	0	1	4	4
Tennessee	1	0	23	20	0	0	3	3
Alabama [4]	1	0	4	6	2	0	0	3
Mississippi [2]	3	0	6	6	1	0	0	2
West South Central States:								
Arkansas	2	0	10	8	0	0	2	1
Louisiana	1	0	22	3	0	1	9	5
Oklahoma [5]	3	0	36	36	2	0	1	2
Texas [4]	0	3	128	65	6	2	19	3
Mountain States:								
Montana	0	1	17	66	10	11	2	0
Idaho [3]	0	1	22	23	6	3	1	0
Wyoming [3]	0	0	18	77	4	24	0	0
Colorado [3]	0	0	29	87	14	24	0	0
New Mexico	0	0	29	52	0	0	4	1
Arizona	0	1	11	23	0	0	3	0
Utah [2]	0	0	4	41	0	4	0	0
Pacific States:								
Washington	1	0	34	73	8	9	3	3
Oregon [3]	0	0	39	21	10	8	0	5
California [4]	5	4	174	271	12	1	5	13
Total	21	22	6,338	6,104	252	272	110	129
First 18 weeks of year	393	292	23,493	138,597	5,737	4,056	1,990	1,958

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended May 8, 1937, 18 cases, as follows: Virginia, 1; Idaho, 3; Wyoming, 9; Colorado, 2; Oregon, 3.
[4] Typhus fever, week ended May 8, 1937, 37 cases, as follows: Georgia, 17; Alabama, 5; Texas, 14; California, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1937										
Idaho		1	34		95		1	112	7	1
April 1937										
Arkansas	3	10	334	60	7	22	0	35	14	7
Connecticut	7	12	40		2,803		1	691	0	2
District of Columbia	10	47	6		403		1	63	0	4
Missouri	11	98	485	14	202	1		1,908	292	6
New Mexico	2	10	7	1	415	1	3	130	0	11
Pennsylvania	51	167			3,819		1	3,469	0	27
West Virginia	25	43	244		303		6	226	1	10

Summary of monthly reports from States

March 1937

	Cases
Idaho:	
Chicken pox	86
Conjunctivitis	3
Encephalitis, epidemic or lethargic	1
German measles	10
Mumps	78
Septic sore throat	4
Undulant fever	1
Whooping cough	42

April 1937

	Cases
Chicken pox:	
Arkansas	71
Connecticut	877
District of Columbia	153
Missouri	302
New Mexico	102
Pennsylvania	4,482
West Virginia	145
Conjunctivitis:	
Connecticut	13
Dysentery:	
Arkansas (amoebic)	1
Connecticut (amoebic)	1
Connecticut (bacillary)	3
Missouri	3
New Mexico (amoebic)	1
New Mexico (bacillary)	1
Pennsylvania (bacillary)	1
Encephalitis, epidemic or lethargic:	
Connecticut	1
District of Columbia	1
Missouri	1
New Mexico	1
Pennsylvania	1
German measles:	
Connecticut	127
New Mexico	5
Pennsylvania	468
Hookworm disease:	
Arkansas	1
Lead poisoning:	
Connecticut	1
Mumps:	
Arkansas	24
Connecticut	649
Missouri	134
New Mexico	46
Pennsylvania	3,136
West Virginia	71
Ophthalmia neonatorum:	
Arkansas	2
Connecticut	2
Missouri	1
New Mexico	7
Pennsylvania	2
Paratyphoid fever:	
Connecticut	1
New Mexico	1
Rabies in animals:	
Connecticut	10
Missouri	2
New Mexico	3
West Virginia	2
Septic sore throat:	
Connecticut	44
Missouri	60
New Mexico	18
Tetanus:	
Missouri	1
Trachoma:	
Pennsylvania	3
Trichinosis:	
Connecticut	3
Pennsylvania	3
Tularaemia:	
Arkansas	2
Undulant fever:	
Arkansas	2
Connecticut	3
District of Columbia	1
Missouri	3
New Mexico	1
Pennsylvania	3
Whooping cough:	
Arkansas	44
Connecticut	254
District of Columbia	47
Missouri	607
New Mexico	111
Pennsylvania	1,952
West Virginia	331

PLAGUE INFECTION FOUND IN FLEAS TAKEN FROM GROUND SQUIRRELS IN OREGON

According to a communication dated May 7, 1937, from Senior Surgeon C. R. Eskey, plague infection was proved on that date, by animal inoculation, in a lot of 56 fleas taken from Oregon ground squirrels (*Citellus oregonus*) shot 14 miles north of Lakeview, Lake County, Oreg., on April 28, 1937.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 1, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	207	209	68	7,726	747	2,504	23	437	28	1,516	--------
Current week [1]	143	116	69	4,171	691	2,558	47	406	17	1,427	--------
Maine:											
Portland	0	------	0	0	1	3	0	0	0	5	20
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Nashua	0	------	--------	2	-------	0	0	-------	0	0	9
Vermont:											
Barre	0	------	0	0	0	0	0	2	0	0	4
Burlington	0	------	0	0	0	0	0	0	0	1	10
Rutland	1	------	0	3	0	2	0	0	0	4	9
Massachusetts:											
Boston	2	------	0	41	34	61	0	13	0	50	250
Fall River	1	------	1	31	1	3	0	1	0	4	33
Springfield	0	------	0	2	1	7	0	0	0	10	40
Worcester	0	------	0	34	5	7	0	5	0	25	58
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	21
Providence	0	------	0	160	4	35	0	3	1	47	70
Connecticut:											
Bridgeport	0	1	1	3	5	60	0	0	0	0	35
Hartford	0	------	0	21	2	7	0	1	0	1	49
New Haven	0	1	0	4	0	11	0	0	0	0	46
New York:											
Buffalo	0	------	3	114	13	10	0	12	0	37	170
New York	41	13	6	623	133	490	0	89	6	54	1,575
Rochester	0	1	0	3	8	2	0	1	0	14	77
Syracuse	1	------	0	26	2	34	0	0	0	33	53
New Jersey:											
Camden	0	------	1	2	4	5	0	0	0	3	37
Newark	0	1	1	354	7	14	0	5	0	15	93
Trenton	0	------	0	1	1	9	0	1	0	2	33
Pennsylvania:											
Philadelphia	7	2	0	49	38	261	0	16	1	33	507
Pittsburgh	1	7	6	91	27	51	0	8	0	19	169
Reading	0	------	1	417	2	13	0	1	0	3	43
Scranton	0	------	--------	0	-------	19	0	-------	0	1	--------
Ohio:											
Cincinnati	0	------	2	262	12	15	0	10	1	9	159
Cleveland	5	16	3	317	21	103	0	14	0	40	216
Columbus	0	------	0	9	4	7	0	4	0	27	94
Toledo	0	3	1	234	7	10	0	5	0	36	75
Indiana:											
Anderson	0	------	1	10	0	11	0	0	0	0	9
Fort Wayne	0	------	0	1	1	2	0	2	0	2	18
Indianapolis	2	------	3	242	11	45	0	4	0	41	105
South Bend	1	------	0	5	2	2	0	0	0	0	18
Terre Haute	1	------	0	0	0	3	2	0	0	1	17
Illinois:											
Alton	0	------	0	0	0	11	0	0	0	0	11
Chicago	10	13	5	84	44	268	0	36	0	73	672
Elgin	0	------	0	0	0	0	0	0	0	5	6
Moline	0	------	0	0	3	1	0	1	0	8	15
Springfield	0	------	0	0	4	3	0	0	0	2	20
Michigan:											
Detroit	7	------	3	21	32	373	0	20	2	94	291
Flint	1	------	0	0	10	12	0	0	0	1	34
Grand Rapids	0	------	0	78	1	12	0	0	0	42	35
Wisconsin:											
Kenosha	0	------	0	0	0	2	0	0	0	0	6
Madison	0	------	0	0	0	13	0	2	0	8	24
Milwaukee	0	2	2	3	5	81	0	3	0	16	112
Racine	0	------	0	1	1	9	0	0	0	2	19
Superior	0	------	0	0	1	3	0	0	0	8	[illegible]

[1] Figures for Helena, Mont., estimated; report not received.

City reports for week ended May 1, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Minnesota:											
Duluth	0	------	0	1	4	14	0	1	0	9	35
Minneapolis	1	------	1	2	8	32	0	1	0	34	111
St. Paul	0	------	0	1	12	13	0	1	0	110	56
Iowa:											
Cedar Rapids	0	------	------	0	------	2	0	------	0	1	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	1	------	38	1	------	0	4	33
Sioux City	0	------	------	0	------	9	0	------	0	0	------
Waterloo	0	------	------	0	------	6	0	------	1	4	------
Missouri:											
Kansas City	0	2	2	0	13	57	0	8	0	12	117
St. Joseph	0	------	0	0	3	22	18	0	0	1	28
St. Louis	3	------	1	10	15	190	0	9	1	66	256
North Dakota:											
Fargo	0	------	0	0	0	0	2	1	0	0	6
Grand Forks	0	------	0	0	0	0	0	0	0	0	1
Minot	0	------	0	0	0	0	1	0	0	0	8
South Dakota:											
Aberdeen	1	------	------	0	------	4	0	------	0	0	------
Sioux Falls	0	------	0	0	0	6	0	0	0	0	8
Nebraska: Omaha	0	------	0	0	7	10	9	1	0	7	64
Kansas:											
Lawrence	0	------	0	0	0	4	0	0	0	0	8
Topeka	0	------	2	1	1	8	0	0	0	8	29
Wichita	0	------	0	34	3	6	1	1	0	19	33
Delaware:											
Wilmington	0	------	0	6	5	1	0	1	0	1	30
Maryland:											
Baltimore	4	2	0	363	22	17	0	9	1	76	226
Cumberland	0	------	0	0	0	0	0	0	0	1	16
Frederick	0	------	0	8	0	0	0	0	0	0	3
Dist. of Col.:											
Washington	11	2	2	75	10	12	0	11	0	16	163
Virginia:											
Lynchburg	2	------	1	4	5	0	0	0	0	12	13
Norfolk	0	------	0	7	4	2	0	1	0	13	19
Richmond	0	------	4	6	0	3	0	1	0	1	58
Roanoke	0	------	0	252	1	0	0	1	0	0	19
West Virginia:											
Charleston	0	------	0	0	3	4	0	2	0	0	20
Huntington	2	------	------	2	------	2	0	------	0	0	------
Wheeling	0	------	0	1	0	1	0	0	0	9	21
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	1	------
Raleigh	0	------	0	1	1	0	0	1	0	0	17
Wilmington	0	------	0	0	1	0	0	0	0	2	14
Winston-Salem	0	------	0	2	2	6	0	0	0	2	13
South Carolina:											
Charleston	0	10	0	0	6	1	0	0	0	0	26
Florence	0	------	0	1	2	0	0	0	0	0	10
Greenville	0	------	0	1	1	0	0	1	0	6	13
Georgia:											
Atlanta	0	8	3	1	7	3	0	7	0	1	98
Brunswick	0	------	0	1	0	0	0	0	0	0	1
Savannah	1	9	0	0	------	1	------	3	------	8	31
Florida:											
Miami	0	2	1	0	0	0	0	4	0	0	35
Tampa	1	------	0	4	3	2	0	0	0	5	22
Kentucky:											
Covington	0	------	1	24	3	1	0	0	0	2	15
Lexington	0	------	0	1	2	0	0	2	0	15	21
Louisville	0	3	0	24	5	15	0	5	0	46	96
Tennessee:											
Knoxville	0	------	0	1	4	0	0	2	0	0	40
Memphis	2	------	2	32	7	3	0	11	0	42	89
Nashville	0	------	1	6	5	4	0	2	0	6	59
Alabama:											
Birmingham	2	12	4	3	10	0	0	5	0	5	65
Mobile	0	1	1	0	3	3	0	0	0	0	27
Montgomery	0	4	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	1	------	1	0	------	0	1	------
Little Rock	0	------	0	0	1	4	0	2	0	0	4
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	0	0	0	4
New Orleans	7	------	3	2	13	15	0	11	1	20	143
Shreveport	0	------	0	0	1	0	0	0	0	0	44

City reports for week ended May 1, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Muskogee	1	------	------	0	------	0	0	------	0	0	------
Oklahoma City	1	------	1	0	14	5	0	0	0	2	40
Tulsa	0	------	------	3	------	5	0	------	0	7	------
Texas:											
Dallas	3	------	0	197	5	6	0	4	0	47	62
Fort Worth	0	------	0	28	2	7	0	3	0	8	32
Galveston	1	------	0	0	1	1	0	0	0	0	15
Houston	6	------	2	0	15	4	0	4	1	0	91
San Antonio	1	------	0	8	8	0	0	10	0	1	67
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	9
Great Falls	0	------	0	0	0	1	0	0	0	3	6
Missoula	0	------	0	0	0	0	1	0	0	0	4
Idaho:											
Boise	0	------	0	0	0	1	0	0	1	0	8
Colorado:											
Colorado Springs	0	------	0	0	4	2	0	0	0	0	13
Denver	1	------	0	16	7	15	0	4	0	31	74
Pueblo	0	------	0	0	0	0	0	0	0	1	11
New Mexico:											
Albuquerque	0	------	0	5	1	4	0	3	1	0	8
Utah:											
Salt Lake City	0	------	0	18	4	10	0	7	0	14	44
Washington:											
Seattle	1	------	1	3	3	2	0	5	0	42	86
Spokane	0	------	0	27	6	10	4	0	0	2	45
Tacoma	0	------	0	0	1	2	1	1	0	1	31
Oregon:											
Portland	0	3	1	5	7	21	1	1	0	13	71
Salem	0	------	------	0	------	0	0	------	0	0	------
California:											
Los Angeles	13	9	1	42	22	29	9	15	1	82	312
Sacramento	0	------	0	39	1	3	0	6	0	5	26
San Francisco	3	1	0	3	9	15	0	9	0	22	149

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	1	0	0
New York:			
New York	11	2	0
Newark	3	0	0
Pennsylvania:			
Philadelphia	1	0	0
Pittsburgh	3	2	0
Ohio:			
Cincinnati	4	3	0
Cleveland	1	1	0
Toledo	1	0	0
Illinois:			
Chicago	4	0	0
Michigan:			
Detroit	1	0	0
Missouri:			
Kansas City	2	1	0
St. Louis	1	0	0
Kansas:			
Lawrence	1	1	0
Maryland:			
Baltimore	1	0	0
District of Columbia:			
Washington	1	1	0
West Virginia:			
Wheeling	1	0	0
North Carolina:			
Wilmington	8	0	0
Georgia:			
Atlanta	1	0	0
Florida:			
Miami	0	1	0
Kentucky:			
Louisville	2	1	0
Tennessee:			
Knoxville	1	1	0
Memphis	0	1	0
Nashville	1	0	0
Alabama:			
Birmingham	5	2	0
Mobile	0	1	0
Louisiana:			
Shreveport	0	2	0
Texas:			
Dallas	1	1	0
Houston	1	0	0
Colorado:			
Pueblo	0	1	0
Washington:			
Spokane	1	0	0
Oregon:			
Portland	1	1	0
California:			
Los Angeles	1	0	2
San Francisco	1	0	2

Encephalitis, epidemic or lethargic.—Cases: New York, 2.

Pellagra.—Cases: Wilmington, N. C., 1; Charleston, S. C., 2; Atlanta, 1; Savannah, 4; Birmingham, 1; San Francisco, 1.

Typhus fever.—Cases: New York, 1; Atlanta, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 24, 1937.—During the 2 weeks ended April 24, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2	1		1			4
Chicken pox				285	656	41	30	8	73	1,093
Diphtheria		5	39	28	21	4	1		3	101
Dysentery				2	3					5
Erysipelas				17	13	6	7	5	2	50
Influenza	1	22		547	488	39	50		87	1,234
Lethargic encephalitis					1					1
Measles		79	18	757	787	280	366	90	425	2,802
Mumps		3	35		776	25	22	35	56	952
Paratyphoid fever		1			3					4
Pneumonia	10	3			48		16		25	102
Poliomyelitis				1						1
Scarlet fever	1	20	10	128	287	50	74	100	35	705
Trachoma							5			5
Tuberculosis	4	18	15	116	137	30	8	3	23	349
Typhoid fever			5	10	5		4			24
Undulant fever					4	1				5
Whooping cough		12		313	296	53	54	8	16	747

GERMANY

Vital statistics—1936.—The following table shows the number of marriages, births, and deaths in Germany during the year 1936:

	Number	Rate per 1,000 population		Number	Rate per 1,000 population
Marriages	611,114	9.1	Total deaths	796,971	11.8
Live births	1,279,025	19.0	Deaths under 1 year of age	84,073	[1] 6.6
Stillbirths	33,320				

[1] Per 100 live births.

PANAMA CANAL ZONE

Notifiable diseases—January–March 1937.—During the months of January, February, and March 1937, certain notifiable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	January		February		March	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	8		4		5	
Diphtheria	24	1	15	1	19	
Dysentery (amoebic)	11	1	5	1	11	2
Dysentery (bacillary)	12	6	13	10	10	
Leprosy	1	1				
Malaria	98	4	120	2	140	1
Measles	205	1	122		63	2
Mumps	78		32		43	
Pneumonia		49		22		19
Poliomyelitis			1			
Relapsing fever	1		1		1	
Scarlet fever			1			
Tuberculosis		32		31		34
Typhoid fever	4				2	
Whooping cough	9	1	2		6	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 30, 1937, pages 571–585. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 28, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Brazil.—During the month of February 1937, plague was reported in Brazil as follows: Parahyba State, 1 case; Pernambuco State, 2 cases, 1 death.

Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.—A rat found on May 10, 1937, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been proved plague-infected.

Peru.—During the month of March 1937, plague was reported in Peru as follows: Cajamarca Department, 1 case; Libertad Department, 12 cases, 6 deaths; Lima Department, 1 case, 1 death; Piura Department, 14 cases, 1 death.

Senegal—Tivaouane.—On April 27, 1937, 1 case of plague was reported in Tivaouane, Senegal.

United States—Oregon.—A report of plague infection in fleas taken from ground squirrels in Lake County, Oregon, appears on page 677 of this issue of PUBLIC HEALTH REPORTS.

Smallpox

Honduras—Puerto Castilla.—During the week ended April 17, 1937, 1 case of smallpox was reported in Puerto Castilla, Honduras.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Matto Grosso State, Maracaju, February 25, 1 case, March 1, 1 case; Tres Lagoas, March 26, 1 death. Minas Geraes State, Campo Bello, March 21, 1 death (first appearance); March 29, 1 death; Lavras, April 5, 1 death; Muzambinho, March 28, 1 death (first appearance); S. Joao del Rey, March 30, 1 death (first appearance), April 5, 1 death; Tres Pontas, March 13, 1 death.

Senegal—Fatick.—On May 6, 1937, 1 case of yellow fever was reported in Fatick, Senegal.

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

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STUDIES IN CHEMOTHERAPY

V. SULPHANILAMIDE, SERUM, AND COMBINED DRUG AND SERUM THERAPY IN EXPERIMENTAL MENINGOCOCCUS AND PNEUMOCOCCUS INFECTIONS IN MICE [1]

By SARA E. BRANHAM, *Senior Bacteriologist*, and SANFORD M. ROSENTHAL, *Senior Pharmacologist, National Institute of Health, United States Public Health Service*

The discovery by Domagk (*1*) that certain sulphonamide compounds are curative in streptococcal infections opened a new field of investigation in chemotherapy of bacterial infections. Trefouel, Nitti, and Bovet (*2*) demonstrated that a relatively simple compound, p-aminobenzene sulphonamide (sulphanilamide), possesses curative action, and this work was soon followed by the report of Buttle, Gray, and Stephenson (*3*), showing, among other things, that sulphanilamide is capable of curing meningococcic infections in mice. Proom (*4*) continued the work upon meningococci and found that curative action could be demonstrated against as many as 1,000,000 fatal doses if adequate therapy was begun immediately after infection.[2] Inferior results were obtained when therapy was delayed. Proom showed that the drug is active against three strains of type I meningococcus and three strains of type II meningococcus. He also found that sulphanilamide is effective when given by mouth. Marshall, Emerson, and Cutting (*5*) studied the absorption and excretion of this drug and found it to be rapidly absorbed from the alimentary canal. They examined the spinal fluid of three patients who were receiving this therapy and found that concentrations slightly lower than those in the blood were reached in the spinal fluid.

In a previous communication (*6*) we have compared the activity of various sulphonamide compounds, including new ones made at this Institute by Dr. Hugo Bauer, upon pneumococcus, streptococcus, and meningococcus infections in mice. Prontosil and Prontosil Soluble were inferior to sulphanilamide. A new compound, di-sulphanilamide, was prepared, which, when tested against streptococcic and meningococcic infections, was found to have a therapeutic value at least five times as favorable as that of sulphanilamide when injected

[1] From the Divisions of Pharmacology and Biologics Control.

[2] Favorable clinical results have subsequently been reported by Schwentker, Gelman, and Long (J. Am. Med. Assoc., 108: 1407 (1937)).

subcutaneously. Further work will be reported concerning the application of this and of other sulphonamide derivatives to therapeutic use.

The present report deals with five groups of experiments: (1) The effect of sulphanilamide upon meningococcus infections in mice; (2) a comparison of oral and subcutaneous administration of sulphanilamide; (3) a comparison of sulphanilamide and immune polyvalent serum in the treatment of meningococcus infections in mice; (4) the effect of combined drug and serum therapy in such infection; and (5) combined drug and serum therapy in pneumococcus infections in mice.

TECHNIQUE

The 20 strains of meningococci used in these studies were obtained from recent cases of meningococcus meningitis; 13 were of group I–III and 7 were of type II. They varied greatly in virulence for mice.

In some of our experiments the cultures were incubated 5 hours and in others 18 hours. In either case the growth from the rabbits' blood agar or serum glucose agar slants was suspended in Ringer's solution and diluted to approximately 2,000,000,000 meningococci per cc as determined by comparison with a standard suspension of 1,000 p.p.m. of silica (*7*). With such a suspension as a starting point, further dilutions were made in a 6 percent solution of mucin[2] prepared according to the method of Miller (*8*).

The number of meningococci in a fatal dose was determined by intraperitoneal injection of 0.5 cc of various dilutions into mice. A fatal dose was considered to be that number of meningococci which killed 80 to 100 percent of the mice within 48 hours. This dose, or some multiple of it, was used in the studies reported here. The fatal dose for these strains was usually 100,000 to 10,000,000, and was sometimes as great as 200,000,000. It was always smaller with 5-hour than with 18-hour cultures. Our strains were, therefore, definitely less virulent than those reported by Proom (*4*), and the number of micro-organisms used in our tests does not represent such a large number of fatal doses. All injections of meningococci were made intraperitoneally, and the suspensions were never allowed to stand longer than one-half hour.

The course of untreated meningococcus infection in mice has been described in detail by Miller (*9*). Symptoms may begin to develop within an hour or two after injection, and death occurs most often in 12 to 24 hours, though it may occur as early as 4 hours or later than 24. Death after 48 hours is usually due to some other cause in untreated animals, though delayed deaths occur not infrequently in the drug-treated animals.

[2] Granular mucin from the Wilson Laboratories, Chicago, Ill.

Sulphanilamide[3] was powdered in a mortar and suspended in olive oil in 20 percent concentration. All injections of it were made subcutaneously in animals in the amounts designated in the individual experiments.

Two polyvalent antimeningococcic sera were used in some of these studies, one being a whole untreated immune serum and the other a concentrated preparation. Both of these had been used repeatedly in mouse-protection tests and had been found to be well above the average serum in protective action. A normal horse serum was included for comparative purposes.

Although many antimeningococcic sera protect mice against a few fatal doses, even in relatively high dilutions, few such sera protect against a large number of fatal doses. Hence by using multiples of the fatal dose for infection of the mice it is easy to find a range within which protection by serum is not complete, thus allowing comparison of the serum protection with the effect of the drug. The unconcentrated serum, designated A, was used in a dilution of 1:5, as was also the normal horse serum; the concentrated serum, designated B, was used in a 1:10 dilution. All serum injections (0.5 cc) were given intraperitoneally.

In some of these experiments in which the drug was the only therapeutic agent, it was given within a few minutes after the injection of meningococci; but in all of the studies of the comparative value of drug and serum they were both given 2 hours after the inoculation. By this time the animals were quite sick and the organisms had invaded the blood stream.

For the pneumococcus experiments a virulent type I strain (Mulford) was employed. One-half cc of an 18-hour broth culture diluted 10^{-7} regularly killed mice following intraperitoneal inoculation. In our experiments 100 lethal doses (10^{-5} dilution) were used.

The antipneumococcus serum contained 300 units (Felton) of type I antibodies and 150 units of type II antibodies per cc. Both drug and serum were given at an interval of 5½ hours after injection of pneumococci.

RESULTS

1. *The effect of sulphanilamide upon meningococcus infections in mice.*—Experiments carried out with 20 strains of meningococci have shown curative effects from sulphonamide therapy in all cases.

In nine of the experiments the drug was administered soon (5 to 20 minutes) after the mice had been inoculated with the meningococci. With five strains, 80 to 100 percent of the mice survived from 1 to 10 lethal doses of meningococci; with the remaining four strains there

[3] Sulphanilamide was obtained from Winthrop Chemical Co. (Prontylin), from Merck & Co., and from Burroughs & Wellcome Co.

were 40 to 60 percent of survivors as a result of the drug treatment. Details of therapy are given in tables 1, 2, and 3.

TABLES 1, 2, 3.—*Therapeutic action of sulphanilamide upon 20 strains of meningococci, serological types I, II, and III. 1 to 10 M. L. D. of organisms used*

[S. A.=sulphanilamide; repeated figures (under "Therapy") represent doses on successive days; organis injected intraperitoneally, drug subcutaneously. M=million; T=thousand; B. D.=twice daily]

TABLE 1

Meningococcus strain and type	Number of organisms	Therapy, grams per kilo	Number of mice	Deaths in days					Mortality percent
				1	2	3	4	5	
931 I	50 M	S. A.: 0.8 B. D., 0.5 B. D.	5	1	2	----	----	----	60
	50 M	None	5	5	----	----	----	----	100
	100 M	S. A.: 0.8 B. D., 0.5 B. D.	5	3	1	----	----	----	80
	100 M	None	5	5	----	----	----	----	100
931 I	100 M	S. A.: 1.0, 1.0, 0.5	5	----	----	----	----	----	0
	50 M	None	5	5	----	----	----	----	100
938 I	50 M	S. A.: 0.8 B. D., 0.5 B. D.	5	----	----	----	----	----	0
	50 M	None	5	5	----	----	----	----	100
	100 M	S. A.: 0.8 B. D., 0.5 B. D.	5	----	----	----	----	----	0
	100 M	None	5	5	----	----	----	----	100
937 I	50 M	S. A.: 1.0, 1.0, 0.5	5	----	----	----	----	----	0
	10 M	None	5	5	----	----	----	----	100
	50 M	None	5	5	----	----	----	----	100
	100 M	S. A.: 1.0, 1.0, 0.5	5	----	----	----	----	----	0
	100 M	None	5	5	----	----	----	----	100
962 I	5 M	S. A.: 0.5	20	3	----	5	----	----	40
	5 M	None	20	16	----	2	1	----	95
998 I	2 M	S. A.: 0.8 [1]	10	----	2	----	----	----	20
	2 M	None	10	9	1	----	----	----	100
	20 M	S. A.: 0.8	10	----	3	1	----	----	40
	20 M	None	10	10	----	----	----	----	100
1000 I	2 M	S. A.: 0.8 [1]	10	6	----	----	----	----	60
	2 M	None	10	10	----	----	----	----	100

[1] Therapy 2 hours after infection.

TABLE 2

Meningococcus strain and type	Number of organisms	Therapy, grams per kilo	Number of mice	Deaths in days					Mortality, percent
				1	2	3	4	5	
594 II	10 M	S. A.: 1.0, 1.0, 0.5	5	----	----	----	----	----	0
	10 M	None	5	3	----	----	----	----	60
	100 M	S. A.: 1.0	10	2	----	1	----	1	40
	100 M	None	10	10	----	----	----	----	100
933 II	200 M	S. A.: 1.0 [1]	10	5	----	1	----	----	60
	200 M	None	10	7	----	----	----	----	70
985 II	100 M	S. A.: 1.0 [1]	10	5	3	1	----	----	90
	100 M	None	10	10	----	----	----	----	100
907 II	200 T	S. A.: 0.8 [1]	10	----	----	----	----	----	0
	200 T	None	10	8	----	----	----	----	80
	2 M	S. A.: 0.8 [1]	10	----	2	5	----	----	70
	2 M	None	10	10	----	----	----	----	100
909 II	20 M	S. A.: 0.8 [1]	10	----	----	----	----	----	0
	20 M	None	10	6	1	----	----	----	70
	200 M	S. A.: 0.8 [1]	10	7	1	1	----	----	90
	200 M	None	10	10	----	----	----	----	100

[1] Therapy 2 hours after infection.

TABLES 1, 2, 3.—*Therapeutic action of sulphanilamide upon 20 strains of meningococci, serological types I, II, and III. 1 to 10 M. L. D. of organisms used*—Continued.

[S. A.=sulphanilamide; repeated figures (under "Therapy") represent doses on successive days; organisms injected intraperitoneally, drug subcutaneously. M=million; T=thousand: B. D.=twice daily]

TABLE 3

Meningococcus strain and type	Number of organisms	Therapy, grams per kilo	Number of mice	Deaths in days					Mortality, percent
				1	2	3	4	5	
934 III	50 M	S. A.: 0.8 B. D., 0.5 B. D.	5				1		20
	50 M	None	5	5					100
	100 M	S. A.: As above	5			1			20
	100 M	None	5	5					100
936 III	50 M	S. A.: 0.8 B. D., 0.5 B. D.	5	1					20
	50 M	None	5	5					100
	100 M	S. A.: As above	5		2	1			60
	100 M	None	5	5					100
850 III	200 M	S. A.: 0.5	20	2		5	1		40
	200 M	None	20	16		2	1		95
850 III	200 M	S. A.: 0.8 [1]	10	7		1			80
	200 M	None	10	10					100
952 III	100 M	S. A.: 1.0 [1]	10	1					10
	100 M	None	10	8					80
1001 III	20 M	S. A.: 0.8 [1]	10	1					10
	20 M	None	10	8					80
	200 M	S. A.: 0.8 [1]	10	1	1				20
	200 M	None	10	10					100
1004 I, III	10 M	S. A.: 1.0 [1]	10	1		3			40
	10 M	None	10	8					80
1010 I, III	10 M	S. A.: 0.8 [1]	10	1					10
	10 M	None	10	9					90

[1] Therapy 2 hours after infection.

With 11 strains of meningococci an interval of 2 hours was allowed to elapse before therapy was administered. This therapy consisted of a single subcutaneous injection of 0.8 to 1.0 gram per kilo of sulphanilamide in oil. While this does not represent adequate therapy for maximum curative results, a high percentage of survivors resulted in most cases. With 7 of the strains, 60 to 100 percent of the treated animals survived, while with the other 4 strains 10 to 40 percent survived. Of these 4 strains, 3 were of low virulence, requiring 100 to 200 million organisms per mouse as the minimum fatal dose.

These results are in general accord with those of Proom (*4*), although not quite as striking as his. This may be explained by the fact that the organisms which he employed were more virulent than ours, and also that the therapy which he gave was more extensive.

2. *Comparison of oral and subcutaneous administration of sulphanilamide.*—Proom has demonstrated that excellent results in meningococcus infections in mice can be obtained by either the oral or subcutaneous administration of the drug. He gave two and one-half times the amount by mouth as was given by injection and obtained approximately similar curative effects. However, his experiments were not designed for comparative purposes.

We have compared the activity of sulphanilamide when given in identical doses by mouth and subcutaneously. In two series of experiments the drug was more effective by subcutaneous administration. Whether or not this same superiority of injection over oral dosage would be manifest on continued administration of the drug cannot be decided from these experiments, since an equilibrium of the drug in the body is reached after several days of medication (*5*). In clinical cases, subcutaneous medication would seem indicated at the onset of therapy to ensure the most rapid and effective results.

3. *Comparison of sulphanilamide and serum therapy in meningococcus infections in mice.*—With 10 of the strains of meningococci studied as noted above, comparison was made between drug and serum therapy. Treatment consisted of a single dose of drug or serum 2 hours after intraperitoneal inoculation of the meningococci. Sulphanilamide was given subcutaneously in oil 0.8 to 1.0 gram per kilo. Serum A, diluted 1:5, was used with 4 strains, while serum B (concentrated), diluted 1:10, was administered to the other 6 strains.

With 3 of the 10 strains the drug was more effective, with 4 of them the serum was somewhat more effective, while with the remaining 3 strains no appreciable differences could be noted (table 4). This series of experiments is obviously too small to permit generalization, but it should be pointed out that no correlation was apparent between either the serological type of meningococcus or the virulence of the organism, and the degree of effectiveness of drug or serum.

TABLE 4.—*A comparison of the therapeutic activity of sulphanilamide and serum on 10 strains of meningococci* (for details, see table 5)

[Roman numerals refer to serological type, and figures in parentheses represent number in millions of organisms injected (1 to 10 M. L. D.). Variations in therapeutic results occur which cannot be correlated to the type of organism or its virulence]

S.A. more effective	Serum more effective	S. A. and serum equally effective
Strain	*Strain*	*Strain*
997 II (2 M).	985 II (100 M).	850 III (200 M).
999 II (20 M).	998 I (20 M).	933 II (200 M).
1001 III (200 M).	1000 I (2 M).	1010 I, III (10 M).
	1004 I, III (10 M).	

For practical purposes this would suggest that both drug and serum therapy be employed clinically in the treatment of meningococcic meningitis, as it is at present not possible to predict which type of treatment will give the more favorable results. An examination of our results with this combined therapy provides an added reason for the adoption of such a procedure.

4. *Combined drug and serum therapy in meningococcic infections in mice.*—In all of the experiments in which a comparison was attempted between drug and serum treatment, a series of animals was included to which both drug and serum were given.

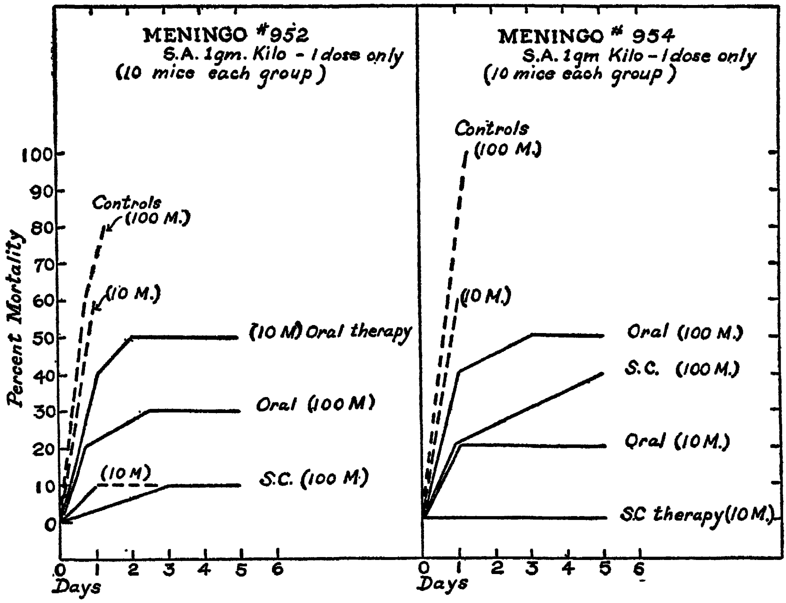

FIGURE 1.—Comparison of oral and subcutaneous therapy with sulphanilamide in meningococcus infection[S] in mice. 1 gm per kilo in each case, orally (stomach tube) suspended in acacia. S. C. in oil. One dose only.

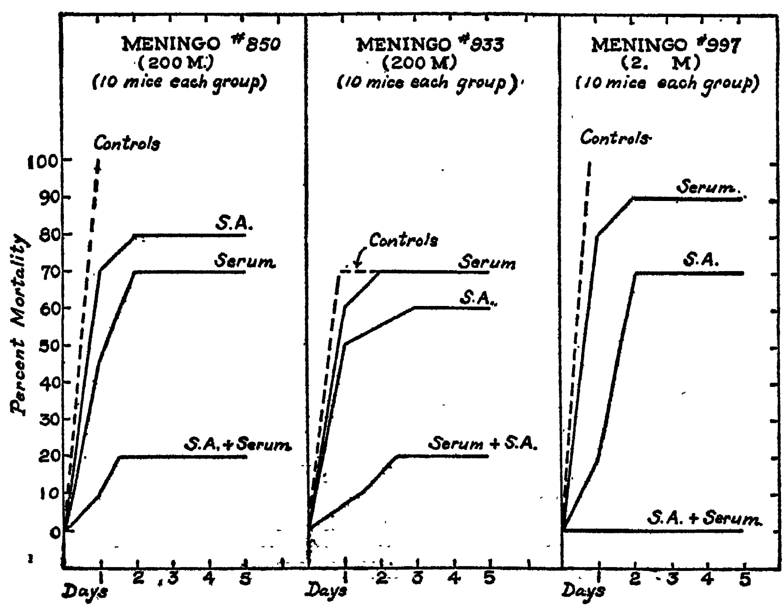

FIGURE 2.—Three experiments with meningococcus infections showing the marked curative effect of combined drug and serum therapy where each alone yielded poor results. Therapy 2 hours after infection. For details consult table 5.

In 6 of the 10 experiments, 90 to 100 percent of mice survived with either the serum or drug alone, so that any added benefit from the combination could not be determined. With 4 strains, conditions were attained whereby neither the drug nor serum gave a high percentage of cure, and in each such instance the combined use of sulphanilamide and serum resulted in a much more favorable outcome (table 5). In three of the four experiments (upon strains 850, 933, 997) the effect of combination therapy was greater than the additive effect of drug and serum alone, suggesting a synergistic action (fig. 2).

The evidence at present, as brought out by Colebrook, Buttle, and O'Meara (*10*), and by Long and Bliss (*11*), indicates that sulphanilamide acts by exerting a bacteriostatic and bactericidal action in the body. The solution to the problem is not as yet complete, since Colebrook, Buttle, and O'Meara could find no appreciable bacteriostatic action against streptococci in the blood of treated mice (as compared with results in man and in the monkey), while the drug is quite effective against streptococcal infections in mice. Furthermore, Rosenthal (*12*) found that sulphanilamide was more than 100 times as bacteriostatic and (or) bactericidal against pneumococci than against streptococci in the test tube, while in mice the drug is more effective against streptococci.

Some preliminary experiments have shown that sulphanilamide in the test tube is inhibitory (*12*), in low concentration, to the growth of meningococci. There is adequate reason to believe that serum and drug operate through different mechanisms and that the best results in the therapy of meningitis can be obtained by employing both forms of treatment. Our animal experiments lend support to this belief.

TABLE 5.—*Comparative results with 10 strains of meningococci with sulphanilamide, serum, and combined drug and serum therapy (10 mice were used in each group. 1 to 10 M. L. D. organisms intraperitoneally. Therapy, 1 injection only, 2 hours after infection. Drug given subcutaneously, serum intraperitoneally)*

Meningococcus strain and type	Number of organisms	Therapy	Deaths in days					Mortality, percent
			1	2	3	4	5	
998 I	2 M	S. A.: 0.8 gm per kilo	1	1	----	----	----	20
	2 M	Serum B, 1:10	----	----	----	----	----	0
	2 M	S. A.+serum	----	----	----	----	----	0
	2 M	None	9	1	----	----	----	100
	20 M	S. A.: 0.8	----	3	1	----	----	40
	20 M	Serum B, 1:10	----	----	----	----	----	0
	20 M	S. A.+serum	1	----	----	----	----	10
	20 M	None	10	----	----	----	----	100
1000 I	2 M	S. A.: 0.8 gm per kilo	4	2	----	----	----	60
	2 M	Serum B, 1:10	----	----	----	----	----	0
	2 M	S. A.+serum	1	----	----	----	----	10
	2 M	None	10	----	----	----	----	100
1004 I, III	10 M	S. A.: 1.0 gm per kilo	1	----	3	----	----	40
	10 M	Serum A, 1:5	----	----	----	----	----	0
	10 M	S. A.+serum	----	----	1	----	----	10
	10 M	None	8	----	----	----	----	80

TABLE 5.—*Comparative results with 10 strains of meningococci with sulphanilamide, serum, and combined drug and serum therapy (10 mice were used in each group. 1 to 10 M. L. D. organisms intraperitoneally. Therapy, 1 injection only, 2 hours after infection. Drug given subcutaneously, serum intraperitoneally)*—Continued

Meningococcus strain and type	Number of organisms	Therapy	Deaths in days					Mortality, percent
			1	2	3	4	5	
1010 I, III	10 M	S. A.: 1.0 gm per kilo	----	----	----	----	----	0
	10 M	Serum A, 1:5	----	----	----	----	----	0
	10 M	S. A.+serum	----	1	----	----	----	10
	10 M	None	7	----	----	----	----	70
933 II	200 M	S. A.: 1.0 gm per kilo	5	----	1	----	----	60
	200 M	Serum A, 1:5	6	----	1	----	----	70
	200 M	S. A.+serum	----	1	1	----	----	20
	200 M	None	7	----	----	----	----	70
985 II	100 M	S. A.: 1.0 gm per kilo	8	1	----	----	----	90
	100 M	Serum A, 1:5	5	----	----	----	----	50
	100 M	S. A.+serum	2	----	2	1	----	50
	100 M	None	10	----	----	----	----	100
	10 M	None	10	----	----	----	----	100
997 II	200 T	S. A.: 0.8 gm per kilo	----	----	----	----	----	0
	200 T	Serum B, 1:10	2	2	----	----	----	40
	200 T	S. A.+serum	1	----	----	----	----	10
	200 T	None	8	----	----	----	----	80
	2 M	S. A.: 0.8 gm per kilo	2	5	----	----	----	70
	2 M	Serum B, 1:10	8	1	----	----	----	90
	2 M	S. A.+serum	----	----	----	----	----	0
	2 M	None	10	----	----	----	----	100
999 II	20 M	S. A.: 0.8 gm per kilo	----	----	----	----	----	0
	20 M	Serum B, 1:10	3	----	----	----	----	30
	20 M	S. A.+serum	----	----	----	----	----	0
	20 M	None	6	1	----	----	----	70
1001 III	20 M	S. A.: 0.8 gm per kilo	1	----	----	----	----	10
	20 M	Serum B, 1:10	----	----	----	----	----	0
	20 M	S. A.+serum	----	----	----	----	----	0
	20 M	None	8	----	----	----	----	80
	200 M	S. A.: 0.8 gm per kilo	1	1	----	----	----	20
	200 M	Serum B, 1:10	7	2	----	----	----	90
	200 M	S. A.+serum	----	1	----	----	----	10
	200 M	None	10	----	----	----	----	100
850 III	200 M	S. A.: 0.8 gm per kilo	7	1	----	----	----	80
	200 M	Serum B, 1:10	5	2	----	----	----	70
	200 M	S. A.+serum	1	1	----	----	----	20
	200 M	None	10	----	----	----	----	100

5. *Combined sulphanilamide and serum therapy in pneumococcus infections in mice.*—We have previously shown that sulphanilamide possesses chemotherapeutic activity against types I, II, and III pneumococcus infections in mice (*13*). The action in mice is not nearly so striking as it is against hemolytic streptococcus infections. More favorable results have been obtained in rats in recent experiments by Gross and Cooper (*14*) against type III organisms and by ourselves (*6*) against types I, II, and III pneumococci.

While appropriate serum therapy is undoubtedly superior to drug therapy in their present stages of development, there is still much to be desired in the serum treatment of pneumococcus infections. In view of our favorable results with combined therapy against the meningococcus, a few experiments of a similar nature were carried out upon the pneumococcus.

Preliminary tests were made to determine the dilution of serum which would save only a small percentage of mice that had been inoculated with pneumococci 5½ hours previously. With the serum employed, this proved to be 0.5 cc of a 1:150 dilution when injected subcutaneously. The pneumococcus used was a virulent type I (Mulford strain); the same quantity was injected in all cases, representing approximately 100 lethal doses of organisms.

Sulphanilamide was given subcutaneously in oil, also at 5½ hours after the intraperitoneal injection of pneumococci. The doses were smaller than those originally used by us against pneumococcus

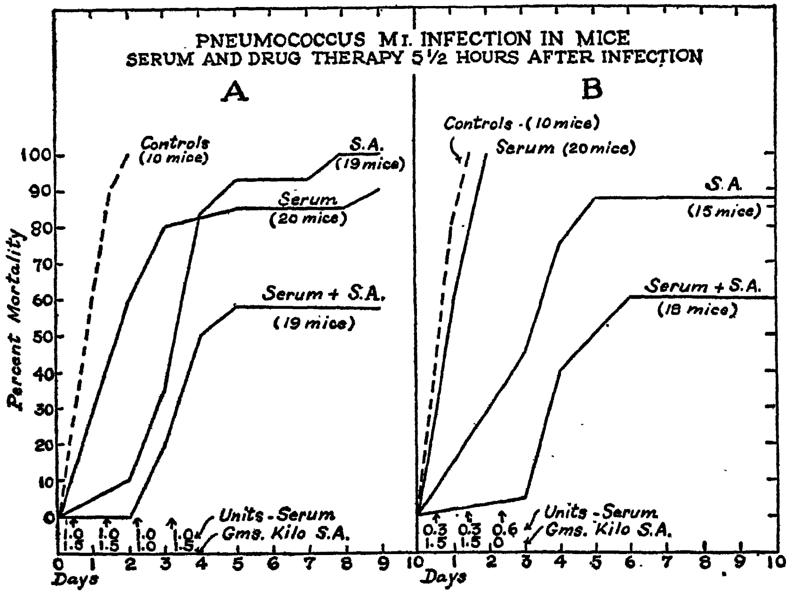

FIGURE 3.—The increased effectiveness of combined drug and serum therapy in type I pneumococcus infection in mice. Treatment S. C. begun 5½ hours after inoculation. Units of serum (Felton) and dosage of sulphanilamide indicated by arrows on the chart.

infections in mice (*12*), although here too the drug produced spasticity and incoordination in some of the animals.

Two series of experiments were performed. Under the conditions of the experiment, 0 to 12 percent of the animals survived when drug or serum alone was used. With combined drug and serum therapy 40 to 45 percent of survivors resulted (fig. 3).

As in the studies with meningococci, the combination of drug and serum resulted in a greater percentage of surviving mice than was accounted for by the sum of the effects of drug and serum alone.

While our experimental findings indicate that striking clinical results are not to be expected from sulphanilamide therapy in systemic pneumococcus infections, they do suggest that drug therapy be used as an adjunct to serum, or in those cases where serum is ineffective

or not available. It should be emphasized that sulphanilamide is not an innocuous drug and that the large doses necessary for therapeutic effect must be administered under careful supervision.

SUMMARY

Sulphanilamide has shown a marked therapeutic action in mice in which a meningococcic infection has been produced experimentally. Twenty strains of meningococci representing types I, II, and III have been used, and a high percentage of treated animals survived fatal doses of the microörganisms even when the single drug injection was given 2 hours after inoculation with the bacteria.

The drug has been found to be more effective by subcutaneous injection than by mouth when administered in the same dosage.

A comparison was made between sulphanilamide and serum therapy with 10 strains of meningococci. With three the drug was more effective, with four the serum was more effective, and with three strains the activity was equal. No correlation existed between therapeutic response and the serological type or virulence of the organism.

The combination of serum and drug therapy yielded much better results than either alone. In four experiments in which poor curative effects were obtained with serum or drug only, combined therapy resulted in the survival of most of the mice. A synergistic action seemed to exist, since the increased effectiveness of combined therapy was greater than the additive effects of drug and serum alone.

The superiority of combined drug and serum therapy was likewise demonstrated in mice infected with type I pneumococci.

The results of these experiments suggest that a combination of drug and serum therapy in meningococcus and pneumococcus infections in man is worthy of trial.

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TREATMENT OF MALARIA

Some helpful references to the treatment of malaria are those appearing in the Indian Medical Gazette [1] and the Quarterly Bulletin of the League of Nations.[2] In his paper, Colonel J. A. Sinton, of the Indian Medical Service, recommends two mixtures, as follows:

Mixture A (Alkaline mixture)

Sodium bicarbonate	4.0 g (60 grains).
Sodium citrate	2.6 g (40 grains).
Calcium carbonate or chloride	0.2 g (3 grains).
Water sufficient to make	28.5 cc (1 ounce).

This mixture should be well shaken before using.

Mixture B (Cinchona mixture)

Quinine sulphate (or cinchona febrifuge)	0.65 g (10 grains)*
Citric acid	2.0 g (30 grains).
Magnesium sulphate	4.0 g (60 grains).
Water sufficient to make	28.5 cc (1 ounce).

Although originally quinine was given three times daily for 7 days, it now seems that twice daily for 5 days produces the same result. The dosage is as follows:

After a preliminary purgation, 1 ounce of mixture A (alkali) is given, repeated in 1 hour and again repeated after 1 hour. One-half hour after the third dose of alkali, 1 ounce of mixture B (quinine) is given. On the same day another ounce of quinine mixture is given, preceded at least one-half hour by an ounce of alkali mixture. Two doses of quinine mixture preceded by an ounce of alkali mixture (one-half hour before) are given twice daily for the next 4 days. During the week following the 5 days of quinine, the patient received daily one-fourth grain (0.015 g) of plasmochin.

During the week of plasmochin treatment the patient should be seen each day by the physician. The occurrence of any symptom of plasmochin poisoning requires cessation of the drug. Continuance of the drug may be followed by serious consequences. Symptoms of plasmochin poisoning: Blue or grayish lips; epigastric pain; sudden weakness; abdominal cramp.

Atabrine may be substituted for quinine; dosage of atabrine is 0.1 g, in tablet form, three times daily. This also is a 5-day treatment.

When the primary attack is treated with one of the two drugs (quinine or atabrine), a relapse should be treated with the other.

[1] Sinton, J. A.: A suggested standard treatment of malaria based upon the results of the controlled investigation of 3,700 cases. Indian Medical Gazette, vol. 65, pp. 603–620. November 1930.

[2] The therapeutics of malaria. 3d. General Report of the Malaria Commission. Quarterly Bulletin of the Health Organization of the League of Nations, vol. 2, no. 2, pp. 185–285, June 1933.

UTILIZATION OF RADIO PRATIQUE AT NEW YORK, FEBRUARY 1 TO APRIL 30, 1937

A report on the inauguration of radio pratique at the port of New York on February 1, 1937, published in the PUBLIC HEALTH REPORTS for April 23, outlined the procedure and gave a summary of the entries of vessels availing themselves of the privilege up to March 26. The accompanying table summarizes the record for the first 3 months of operation under this practice at New York. From February 1 to April 30, 1937, radio pratique was extended in 235 instances. As the vessels entered port on 78 days during this period, an average of a little more than three vessels a day utilized this procedure.

Nationality and number of lines and vessels using radio pratique

Nationality	Number of lines	Eligible vessels	Number of times radio pratique used
American	6	25	73
British	3	22	80
German	3	11	32
French	1	5	14
Italian	1	2	8
Swedish	1	3	8
Dutch	1	4	13
Polish	1	2	6
Norwegian	1	2	1
Total	18	76	235

A total of 76 vessels of 822,308 net tons, belonging to 18 steamship companies under 9 flags, made use of radio pratique during the first 3 months of operation. The 235 entries of these vessels under this procedure totaled 2,750,383 net tons and carried 92,154 passengers and 92,856 crew members.

THE PATHOLOGY OF TULARAEMIA

A monograph comprising 14 articles dealing with the pathologic anatomy and histology of tularaemia in man and in laboratory, wild, and domestic mammals and birds has recently been issued by the United States Public Health Service.[1]

The section on human pathology brings together all the published surgical and post-mortem pathologic material and adds a considerable number of unpublished cases. Material from many of the published autopsies was obtained and restudied for the preparation of this

[1] The Pathology of Tularaemia. By E. Francis, R. D. Lillie, and R. R. Parker. National Institute of Health Bulletin No. 167, 217 pp., 108 halftone illus. Government Printing Office, Washington, D. C., 1937. Price 40 cents.

article. The material is considered by organs and according to the duration of the disease, and at the end of each of the longer sections a summary of the morphology and development of the lesions is presented. Full reference to the previously published accounts is made in the text in connection with each case considered under each organ. The several articles on animal pathology are similarly arranged as far as the material available warrants.

The monograph is not indexed, but a detailed table of contents and a list of illustrations are provided. A comprehensive general bibliography of 105 references, alphabetically arranged, concludes the bulletin.

DEATHS DURING WEEK ENDED MAY 8, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 8, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	8,489	9,044
Average for 3 prior years	8,937	
Total deaths, first 18 weeks of year	177,777	174,146
Deaths under 1 year of age	531	591
Average for 3 prior years	589	
Deaths under 1 year of age, first 18 weeks of year	10,951	10,625
Data from industrial insurance companies:		
Policies in force	69,591,303	68,210,894
Number of death claims	13,214	13,873
Death claims per 1,000 policies in force, annual rate	9.9	10.6
Death claims per 1,000 policies, first 18 weeks of year, annual rate	11.3	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 15, 1937, and May 16, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936
New England States:								
Maine	1	1	1	1	3	375	0	0
New Hampshire					23	35	0	0
Vermont	8	2				437	0	0
Massachusetts	1	9			763	1,614	6	8
Rhode Island					74	68	0	0
Connecticut	7	1	1	2	333	233	0	2
Middle Atlantic States:								
New York	41	37	[1] 7	[1] 3	1,664	3,170	6	27
New Jersey	14	12	4	3	1,814	499	0	2
Pennsylvania	16	34			1,530	616	3	12
East North Central States:								
Ohio	24	24	57	75	2,096	542	5	13
Indiana	13	7	11	40	609	36	5	6
Illinois	36	39	21	29	206	35	3	15
Michigan	8	12			195	164	4	3
Wisconsin	10	6	14	53	44	167	0	0
West North Central States:								
Minnesota	4	1	1	1	15	530	3	3
Iowa	4	5	2		8	5	0	4
Missouri	21	12	32	72	39	30	3	4
North Dakota	1	1	1	12	2	1	1	0
South Dakota	1	1				1	0	0
Nebraska	4	1	1		14	41	4	2
Kansas	2	8	1	20	41	8	0	0
South Atlantic States:								
Delaware					28	27	0	0
Maryland [2 3]	7	5	8	3	446	454	2	11
District of Columbia	3	17			104	186	2	7
Virginia [3]	3	7		68	496	136	6	8
West Virginia	1	7	20	36	39	74	9	8
North Carolina	18	14	7	5	237	47	5	8
South Carolina	6	4	115	126	74	32	2	3
Georgia [4]	8	9					4	1
Florida	7	4		7		25	1	3
East South Central States:								
Kentucky	2	6	5	58	382	38	11	20
Tennessee	9	4	97	71	98	28	5	9
Alabama [4]	8	5	47	54	11	30	5	1
Mississippi [2]	2	6					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 15, 1937, and May 16, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936
West South Central States:								
Arkansas	5	5	50	96	11	3	1	1
Louisiana	12	12	17	506	11	27	1	4
Oklahoma	2	7	14	66	60	46	1	2
Texas [4]	32	37	230	211	758	325	8	7
Mountain States:								
Montana [3]	-------	-------	-------	58	10	5	0	0
Idaho [3]	-------	-------	35	1	22	21	1	0
Wyoming [3]	1	-------	-------	-------	28	2	1	0
Colorado	6	1	-------	-------	25	19	1	1
New Mexico	1	4	2	10	72	44	0	0
Arizona	6	-------	52	48	66	110	0	1
Utah [2]	-------	-------	-------	-------	40	22	1	1
Pacific States:								
Washington	1	1	-------	-------	62	414	2	2
Oregon [3]	4	2	30	19	15	151	0	0
California	31	26	76	259	212	1,908	3	7
Total	386	396	959	2,013	12,870	12,781	115	206
First 19 weeks of year	9,258	10,266	268,978	132,942	153,122	190,966	3,111	4,591

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936
New England States:								
Maine	0	0	17	22	0	0	0	3
New Hampshire	0	0	5	1	0	0	0	1
Vermont	0	0	7	7	0	0	0	0
Massachusetts	0	1	233	218	0	0	2	2
Rhode Island	0	0	48	27	0	0	0	0
Connecticut	0	0	169	36	0	0	1	1
Middle Atlantic States:								
New York	0	3	910	781	0	0	6	17
New Jersey	0	0	241	285	0	0	0	4
Pennsylvania	1	1	479	338	0	0	3	4
East North Central States:								
Ohio	0	0	501	320	0	0	5	5
Indiana	1	2	129	184	21	3	1	4
Illinois	1	1	628	680	43	13	1	6
Michigan	2	0	721	284	9	2	6	8
Wisconsin	0	1	285	431	1	7	1	1
West North Central States:								
Minnesota	0	0	163	366	21	4	6	0
Iowa	0	0	161	137	31	31	0	1
Missouri	1	0	24	140	0	29	3	3
North Dakota	0	0	23	39	5	3	0	0
South Dakota	0	0	40	53	1	32	0	0
Nebraska	0	0	76	87	7	16	0	0
Kansas	0	0	201	212	9	25	1	3
South Atlantic States:								
Delaware	0	0	2	2	0	0	0	0
Maryland [2,3]	0	0	33	43	0	0	2	2
District of Columbia	0	0	10	24	0	0	0	0
Virginia [3]	0	0	18	51	0	1	7	6
West Virginia	0	0	48	26	0	0	3	6
North Carolina	0	1	22	11	0	1	4	4
South Carolina	0	2	-------	3	0	0	1	5
Georgia [4]	1	0	9	25	0	0	13	11
Florida	0	0	7	9	0	0	2	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 15, 1937, and May 16, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936	Week ended May 15, 1937	Week ended May 16, 1936
East South Central States:								
Kentucky	0	0	36	20	0	0	7	4
Tennessee	0	0	17	17	0	0	3	5
Alabama [4]	1	0	8	4	0	0	4	3
Mississippi [2]	5	0	6	5	0	2	3	2
West South Central States:								
Arkansas	0	1	16	3	1	0	1	1
Louisiana	0	0	18	5	0	0	14	3
Oklahoma	1	0	21	56	1	1	3	7
Texas [4]	4	1	93	46	6	7	7	14
Mountain States:								
Montana [3]	0	2	17	114	18	16	0	1
Idaho [3]	0	0	19	17	1	3	0	1
Wyoming [3]	0	0	7	20	5	0	0	0
Colorado	0	0	24	66	15	3	3	0
New Mexico	0	0	21	61	0	0	4	0
Arizona	0	0	16	44	0	0	2	2
Utah [2]	0	0	10	68	0	4	0	0
Pacific States:								
Washington	1	0	22	61	6	5	1	0
Oregon [3]	0	0	45	25	25	13	1	4
California	3	5	177	337	24	2	8	5
Total	22	21	5,783	5,761	250	223	129	154
First 19 weeks of year	415	313	29,276	144,358	5,987	4,279	2,119	2,112

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended May 15, 1937, 14 cases, as follows: Maryland, 1; Virginia, 1; Montana, 1; Idaho, 3; Wyoming, 5; Oregon, 3.
[4] Typhus fever, week ended May 15, 1937, 24 cases, as follows: Georgia, 18; Alabama, 5; Texas, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1937										
Georgia	11	46	4,801	282	38	16	6	57	0	12
Puerto Rico		36	278	714	130	1	0		0	102
Wisconsin	8	9	1,279		72		0	1,334	20	1
Wyoming		1	131		4		0	74	18	1
March 1937										
Arizona	3	16	395	5	953		0	54	0	1
Wisconsin	6	14	385		114		0	1,884	28	17
Wyoming					7		0	117	14	0
April 1937										
California	16	129	1,192	9	1,114	12	14	908	103	24
Colorado	4	26			53		0	150	36	
Indiana	18	37	373		1,209		2	1,030	55	3
Nebraska	7	10			144		2	432	47	1
New Jersey	18	50	36		11,218			852	0	9
North Carolina	32	61	243		860	43	1	162	3	16
Ohio	25	70	213	1	3,771		2	1,455	4	26
South Carolina		49	2,064	696	182	94	1	15	2	7
Wyoming		1			44		0	76	22	0

Summary of Monthly Reports from States—Continued

February 1937

	Cases
Chicken pox:	
Georgia	107
Puerto Rico	44
Wisconsin	2,126
Wyoming	30
Conjunctivitis infectious:	
Georgia	7
Dysentery:	
Georgia (amoebic)	20
Georgia (bacillary)	4
Puerto Rico	57
Wisconsin (amoebic)	1
Encephalitis, epidemic or lethargic:	
Wisconsin	1
Filariasis:	
Puerto Rico	1
German measles:	
Wisconsin	54
Hookworm disease:	
Georgia	1813
Leprosy:	
Puerto Rico	3
Mumps:	
Georgia	149
Puerto Rico	16
Wisconsin	831
Wyoming	114
Ophthalmia neonatorum:	
Puerto Rico	2
Paratyphoid fever:	
Georgia	2
Puerperal septicemia:	
Puerto Rico	8
Rabies in man:	
Georgia	1
Septic sore throat:	
Georgia	42
Wisconsin	9
Wyoming	8
Tetanus:	
Puerto Rico	9
Tetanus, infantile:	
Puerto Rico	4
Trachoma:	
Puerto Rico	1
Tularaemia:	
Georgia	4
Typhus fever:	
Georgia	22
Undulant fever:	
Georgia	3
Wisconsin	8
Whooping cough:	
Georgia	95
Puerto Rico	49
Wisconsin	484
Wyoming	9

March 1937

	Cases
Chicken pox:	
Arizona	73
Wisconsin	2,372
Wyoming	30
Dysentery:	
Arizona	11
Wisconsin (amoebic)	1
Encephalitis, epidemic or lethargic:	
Arizona	2
Wisconsin	2

March 1937—Continued

	Cases
German measles:	
Arizona	9
Wisconsin	71
Mumps:	
Arizona	105
Wisconsin	1,262
Wyoming	198
Ophthalmia neonatorum:	
Wisconsin	1
Septic sore throat:	
Wisconsin	21
Wyoming	2
Trachoma:	
Arizona	25
Undulant fever:	
Wisconsin	7
Whooping cough:	
Arizona	47
Wisconsin	766
Wyoming	2

April 1937

	Cases
Actinomycosis:	
California	1
Botulism:	
California	1
Chicken pox:	
California	4,312
Colorado	200
Indiana	451
Nebraska	248
New Jersey	1,796
North Carolina	699
Ohio	2,383
South Carolina	118
Wyoming	27
Dengue:	
South Carolina	2
Diarrhea:	
Ohio (enteritis included)	6
South Carolina	299
Dysentery:	
California (amoebic)	13
California (bacillary)	12
New Jersey (amoebic)	2
New Jersey (bacillary)	2
North Carolina (bacillary)	3
Encephalitis, epidemic or lethargic:	
California	2
Colorado	1
New Jersey	3
Ohio	3
Food poisoning:	
California	73
German measles:	
California	168
New Jersey	287
North Carolina	1,085
Ohio	98
South Carolina	1
Granuloma, coccidioidal:	
California	5
Hookworm disease:	
California	1
South Carolina	86
Jaundice, epidemic:	
California	11
Lead poisoning:	
Ohio	17

April 1937—Continued

	Cases
Mumps:	
California	3,397
Colorado	42
Indiana	278
Nebraska	131
New Jersey	1,407
Ohio	525
South Carolina	71
Wyoming	194
Ophthalmia neonatorum:	
California	2
New Jersey	14
Ohio	72
South Carolina	3
Paratyphoid fever:	
California	2
Colorado	1
North Carolina	1
South Carolina	1
Psittacosis:	
California	1
Puerperal septicemia:	
Ohio	5
Rabies in animals:	
California	213
Indiana	38
New Jersey	14
South Carolina	41
Rabies in man:	
California	1
Rocky Mountain spotted fever:	
Wyoming	1
Septic sore throat:	
California	13
Colorado	5
Nebraska	4
North Carolina	6
Ohio	113
Wyoming	9
Tetanus:	
California	12
New Jersey	1
Ohio	2
Trachoma:	
California	9
Trichinosis:	
Ohio	1
Tularemia:	
Ohio	3
South Carolina	1
Typhus fever:	
Colorado	1
North Carolina	5
South Carolina	7
Undulant fever:	
California	11
Nebraska	1
New Jersey	5
North Carolina	1
Ohio	5
Vincent's infection:	
Colorado	1
Whooping cough:	
California	2,740
Colorado	187
Indiana	357
Nebraska	86
New Jersey	522
North Carolina	529
Ohio	1,635
South Carolina	185
Wyoming	13

RODENT PLAGUE IN GRANT COUNTY, OREG.

Plague infection was demonstrated on May 10, 1937, in tissue from a ground squirrel, *Citellus oregonus*, shot on a ranch 9 to 12 miles east of John Day, Grant County, Oreg.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 8, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	203	181	58	7,564	711	2,422	23	437	31	1,493	--------
Current week	146	100	51	4,841	647	2,562	19	374	18	1,506	--------
Maine:											
Portland	0	------	0	0	1	1	0	0	0	3	20
New Hampshire:											
Concord	0	------	0	0	1	1	0	0	0	0	11
Manchester	0	------	1	0	2	0	0	0	0	0	16
Nashua	0	------	0	1	2	0	0	0	0	0	4
Vermont:											
Barre	0	------	0	0	1	4	0	0	0	8	5
Burlington	0	------	0	4	0	0	0	0	0	0	9
Rutland	0	------	0	1	0	1	0	0	0	2	6
Massachusetts:											
Boston	1	------	0	43	17	64	0	7	1	51	210
Fall River	0	------	0	31	4	1	0	2	0	1	34
Springfield	0	------	0	0	1	3	0	0	0	2	32
Worcester	0	------	0	34	5	4	0	3	0	21	--------
Rhode Island:											
Pawtucket	0	------	0	0	0	3	0	0	0	0	17
Providence	0	------	0	149	11	41	0	2	0	15	70
Connecticut:											
Bridgeport	0	------	0	12	4	80	0	0	0	0	36
Hartford	1	------	0	25	1	8	0	3	0	1	34
New Haven	0	------	0	10	1	11	0	2	1	4	31
New York:											
Buffalo	0	------	3	102	13	18	0	11	1	21	166
New York	38	7	5	786	119	458	0	85	3	78	1,531
Rochester	0	1	0	1	4	6	0	1	1	5	56
Syracuse	0	------	0	30	2	38	0	1	0	36	51
New Jersey:											
Camden	1	2	2	21	3	4	0	2	0	2	45
Newark	0	------	0	306	14	11	0	8	0	16	123
Trenton	0	------	0	3	6	7	0	1	0	1	42
Pennsylvania:											
Philadelphia	2	6	5	49	37	254	0	17	2	55	470
Pittsburgh	3	1	1	179	21	54	0	10	1	34	185
Reading	0	------	0	484	1	12	0	0	0	1	22
Scranton	0	------	--------	2	--------	16	0	--------	0	0	--------
Ohio:											
Cincinnati	2	------	1	208	25	12	0	8	0	9	159
Cleveland	2	6	1	342	25	142	0	4	0	39	196
Columbus	1	3	3	25	3	6	0	2	0	24	81
Toledo	0	1	1	313	2	2	0	5	0	28	67

City reports for week ended May 8, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Anderson	0	------	0	3	0	9	0	0	0	0	8
Fort Wayne	0	------	0	1	2	2	0	2	1	0	21
Indianapolis	1	------	1	581	9	42	0	6	1	47	104
Muncie	0	------	0	0	1	3	0	2	0	0	12
South Bend	0	------	0	0	1	3	0	1	0	1	22
Terre Haute	4	------	0	3	0	2	2	0	0	0	8
Illinois:											
Alton	0	------	0	0	1	10	0	0	0	0	12
Chicago	18	16	3	140	42	255	0	28	0	67	676
Elgin	0	------	0	0	2	1	0	0	0	5	14
Moline	0	------	0	0	1	0	0	1	0	2	11
Springfield	0	------	0	1	2	4	0	0	0	5	19
Michigan:											
Detroit	5	------	4	25	38	374	1	18	1	70	268
Flint	0	------	0	66	6	14	0	0	1	5	30
Grand Rapids	0	------	0	92	2	12	0	0	0	31	32
Wisconsin:											
Kenosha	0	------	0	0	0	4	0	0	0	3	11
Milwaukee	0	1	1	11	10	71	0	1	0	21	107
Racine	0	------	0	0	0	13	0	1	0	0	15
Superior	1	------	0	0	1	2	0	0	.0	13	4
Minnesota:											
Duluth	0	------	0	0	2	13	0	0	0	3	15
Minneapolis	2	------	0	5	5	20	0	1	0	30	85
St. Paul	0	2	2	0	6	2	0	1	0	100	71
Iowa:											
Cedar Rapids	0	------	------	2	------	3	0	------	0	2	------
Davenport	0	------	------	0	------	0	0	------	0	0	------
Des Moines	0	------	------	0	------	43	0	------	0	0	19
Sioux City	0	------	------	0	------	5	0	------	0	1	------
Waterloo	0	------	------	0	------	6	0	------	0	0	------
Missouri:											
Kansas City	0	------	1	3	15	99	0	8	0	13	102
St. Joseph	1	------	1	0	6	27	12	1	0	2	38
St. Louis	6	1	0	23	8	150	0	9	0	68	186
North Dakota:											
Fargo	0	------	0	0	1	2	0	0	0	0	5
Grand Forks	0	------	------	0	------	0	0	------	0	3	------
Minot	0	------	0	0	0	0	1	0	0	0	8
South Dakota:											
Aberdeen	0	------	------	0	------	5	0	------	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	0	1	6	10	1	3	0	16	61
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	4
Topeka	0	------	0	0	1	13	0	0	0	27	9
Wichita	0	------	0	11	5	9	0	1	0	12	21
Delaware:											
Wilmington	0	------	0	7	0	4	0	0	0	5	------
Maryland:											
Baltimore	8	5	1	349	21	27	0	20	0	92	222
Cumberland	0	------	0	0	0	1	0	0	0	4	13
Frederick	0	------	0	4	0	0	0	0	0	0	5
Dist. of Columbia:											
Washington	5	------	0	103	5	13	0	12	0	9	155
Virginia:											
Lynchburg	0	------	0	8	3	0	0	0	0	15	9
Richmond	0	------	0	2	3	3	0	0	1	6	57
Roanoke	0	------	0	176	0	0	0	0	0	5	15
West Virginia:											
Charleston	0	------	0	0	3	1	0	0	0	0	21
Huntington	0	------	------	1	------	7	0	------	0	0	------
Wheeling	0	------	0	2	2	0	0	0	0	15	17
North Carolina:											
Gastonia	0	------	0	0	0	0	0	0	0	1	------
Raleigh	0	------	0	1	1	0	0	0	0	0	6
Wilmington	0	------	0	0	3	0	0	0	0	0	17
Winston-Salem	0	------	0	0	0	1	0	0	0	4	13
South Carolina:											
Charleston	0	18	1	1	4	0	0	1	0	0	21
Columbia	0	------	0	0	1	0	0	1	0	0	7
Florence	0	------	0	0	0	0	0	0	0	0	5
Greenville	0	------	0	0	1	0	1	0	0	1	19

City reports for week ended May 8, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Georgia:											
Atlanta	1	3	0	0	6	2	0	7	0	13	76
Brunswick	0	------	0	0	0	0	0	0	0	1	5
Savannah	0	3	0	0	4	0	0	2	1	0	39
Florida:											
Miami	1	------	0	1	2	0	0	2	0	0	38
Tampa	1	------	0	12	0	0	0	2	0	7	24
Kentucky:											
Ashland	0	------	1	140	1	0	0	2	0	0	17
Covington	0	------	0	0	1	3	0	1	0	1	15
Lexington	0	------	0	2	1	0	0	3	0	18	20
Louisville	2	------	0	30	3	18	0	6	0	28	86
Tennessee:											
Knoxville	2	------	1	0	3	0	0	3	0	0	32
Memphis	1	------	1	33	6	1	0	4	0	47	71
Nashville	0	------	1	15	5	4	0	1	0	7	47
Alabama:											
Birmingham	1	5	0	13	6	1	0	3	0	4	49
Mobile	0	------	4	0	2	1	0	0	0	0	20
Montgomery	0	3	------	0	------	0	0	------	0	3	------
Arkansas:											
Fort Smith	0	------	------	0	------	0	0	------	0	0	------
Little Rock	0	------	0	0	5	4	0	1	0	0	6
Louisiana:											
Lake Charles	0	------	0	0	1	0	0	1	0	0	4
New Orleans	6	3	2	4	11	17	0	12	1	1	123
Shreveport	0	------	0	0	3	0	0	2	0	0	41
Oklahoma:											
Muskogee	0	------	------	2	------	0	0	------	0	0	------
Oklahoma City	1	6	0	21	6	10	0	2	0	5	58
Tulsa	0	------	------	4	------	3	0	------	1	13	------
Texas:											
Dallas	0	2	1	167	5	9	0	2	0	32	58
Fort Worth	0	------	0	21	3	9	0	6	0	10	40
Galveston	0	------	0	0	0	1	0	2	0	0	9
Houston	6	6	0	3	8	7	0	6	0	23	91
San Antonio	0	------	2	2	3	0	0	9	0	0	68
Montana:											
Billings	0	------	0	0	1	0	0	0	0	0	5
Great Falls	0	------	0	0	1	0	0	0	0	0	12
Helena	0	1	1	0	0	1	1	0	0	0	4
Missoula	0	------	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	0	------	0	0	0	1	0	0	0	1	7
Colorado:											
Colorado Springs	0	------	0	0	1	6	0	1	0	0	8
Denver	3	------	0	15	7	16	0	6	0	23	79
Pueblo	0	------	0	0	0	0	0	0	0	0	4
New Mexico:											
Albuquerque	0	------	0	2	0	4	0	5	0	5	15
Utah:											
Salt Lake City	0	------	0	23	3	3	0	1	0	23	41
Washington:											
Seattle	0	------	1	3	1	1	0	3	0	50	87
Spokane	1	------	0	25	3	6	0	0	0	18	21
Tacoma	0	------	1	0	5	3	0	0	0	1	32
Oregon:											
Portland	0	1	1	4	4	22	2	3	0	1	79
Salem	0	1	------	0	------	0	0	------	0	0	------
California:											
Los Angeles	25	7	0	28	25	32	2	21	0	100	321
Sacramento	1	------	0	31	1	5	0	0	0	6	30
San Francisco	0	1	1	11	8	14	0	7	1	33	165

City reports for week ended May 8, 1937—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis
	Cases	Deaths			Cases	Deaths	
Massachusetts:				District of Columbia:			
Boston	5	4	0	Washington	1	0	0
Fall River	1	1	0	Virginia:			
Rhode Island:				Richmond	1	1	0
Providence	1	1	0	North Carolina:			
New York:				Wilmington	1	1	0
Buffalo	1	0	0	South Carolina:			
New York	6	4	1	Charleston	1	1	0
New Jersey:				Georgia:			
Newark	1	1	0	Atlanta	1	0	0
Pennsylvania:				Kentucky:			
Philadelphia	1	0	0	Ashland	1	0	0
Pittsburgh	1	0	0	Louisville	1	1	0
Ohio:				Tennessee:			
Cincinnati	2	1	0	Knoxville	0	0	1
Cleveland	1	0	0	Alabama:			
Toledo	1	0	0	Birmingham	4	2	0
Illinois:				Louisiana:			
Chicago	8	1	1	New Orleans	1	0	0
Michigan:				Shreveport	0	1	0
Detroit	1	0	0	Texas:			
Minnesota:				Houston	4	0	2
Minneapolis	1	0	0	San Antonio	0	0	2
Missouri:				Colorado:			
St. Joseph	0	1	0	Denver	0	1	0
St. Louis	2	0	0	California:			
Maryland:				Los Angeles	1	1	2
Baltimore	6	1	0	San Francisco	0	0	1

Encephalitis, epidemic or lethargic.—Cases: New York, 1; Pittsburgh, 1; Louisville, 1.

Pellagra.—Cases: Charleston, S. C., 4; Atlanta, 2; Memphis, 1; Nashville, 1; Birmingham, 1; Montgomery, 1; San Francisco, 1.

Typhus fever.—Cases: Atlanta, 1; Savannah, 1.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended May 1, 1937.—During the 4 weeks ended May 1, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	1	9		2	13
Chicken pox			4	6	2	7	19
Diphtheria	1	1	1	3	2	1	9
Dysentery (amoebic)				1			1
Hookworm disease				1			1
Leprosy		1	1	1	2	4	9
Malaria	72	41	6	137	81	234	571
Measles	26		21			4	51
Poliomyelitis						1	1
Trachoma				43			43
Tuberculosis	38	16	5	68	24	47	198
Typhoid fever	9	43	11	37	11	130	241
Yaws						1	1

DOMINICAN REPUBLIC

Compulsory diphtheria immunization.—According to a report from the American Legation at Ciudad Trujillo, Santo Domingo, dated May 7, 1937, a Presidential decree dated May 6, 1937, made diphtheria immunization compulsory for all school children in the Dominican Republic. A mild epidemic of diphtheria was reported in the Republic.

ITALY

Communicable diseases—4 weeks ended February 28, 1937.—During the 4 weeks ended February 28, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Feb. 1–7		Feb. 8–14		Feb. 15–21		Feb. 22–28	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	5	5	14	12	9	9	8	8
Cerebrospinal meningitis	26	25	23	19	35	32	48	38
Chicken pox	497	162	512	187	520	171	545	176
Diphtheria	473	262	482	264	597	309	532	286
Dysentery	7	6	10	10	7	7	7	5
Hookworm disease	2	2	5	5	1	1	8	1
Lethargic encephalitis	1	1	3	3	2	2	2	2
Measles	1,926	305	2,004	311	2,306	280	2,264	307
Mumps	461	139	436	108	620	131	743	149
Paratyphoid fever	15	14	20	19	32	26	18	17
Poliomyelitis	16	14	9	9	15	13	14	12
Puerperal fever	34	32	43	38	36	34	46	38
Scarlet fever	332	121	348	126	323	132	361	120
Typhoid fever	127	91	143	102	176	113	161	115
Undulant fever	60	46	72	43	64	48	85	50
Whooping cough	651	110	531	191	554	173	605	172

SIAM

Cholera.—A report dated April 28, 1937, from the American consulate general at Bangkok, Siam, states that the cholera epidemic increased during April to an alarming extent both in Bangkok and throughout the country. There were 948 cases and 504 deaths in Bangkok from April 1 to 24 as compared with 226 cases and 153 deaths for the entire month of March. For the entire country there were 2,954 cases and 1,928 deaths from April 1 to 24, as compared with 1,803 cases and 1,195 deaths for the whole of March. The increase in cholera for April brings the total number of cases officially reported in the country since the beginning of the outbreak in December 1936, to 7,135, of which 4,629 resulted in death. According to the report the epidemic is the most formidable of any in recent years; and in view of the hot season, no abatement may be expected in the near future.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan-American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937				March 1937				April 1937				May 1, 1937
						6	13	20	27	6	13	20	27	3	10	17	24	
Afghanistan	C	P																
Ceylon: Batticaloa	C	3																
India	C	20,423	23,017	17,965	20,182	2,839	1,778	1,473	1,646	2,091	2,560	4,295	4,069					
	D	9,520	11,747	9,506	11,282	1,559	1,026	821	899	1,098	1,301	2,045	2,044					
Assam	C	308	710	664	585	82	34	29	52	62	64	101	167	236	402	446	739	706
	D	184	318	315	330	30	19	12	19	24	26	42	69	99	138	186	305	289
Bassein	C							4	4	3	9	17	8	8	9	21	48	46
Bombay Presidency	C	4,281	2,359	2,637	646	62	53	77	61	28	27	19	24					
	D	1,575	1,120	1,467	249	32	26	45	39	14	14	7	9					
Bombay	C	[1] 1		2												[1] 1		[1] 1
Calcutta	C	73	61	61	88	26	14	26	21	16	21	35	34	44	37	49	117	94
Central Provinces and Berar	C	4,239	922	567	125					2	1	1					5	5
Chittagong	C	2	16	11	3	1	1						3		1	6	6	[1] 1
Madras Presidency	C	6,271	10,204	5,588	10,652	1,986	1,195	643	692	505	689	1,302	690					
	D	3,143	5,161	2,885	5,712	1,081	677	371	385	262	326	610	361					
Madras	C	21	57	60	75	6	12	4	3		1	2	2	1	2	1		
	D	6	12	21	41	2	9	2	1			1			1			
Negapatam	C			11	22	3		1		1			1					
	D			7	13	1												
Northwest Frontier Province	C		84	7														
Orissa Province	C		155	994	880	163	144	168	134	137	137	148	180		137	157	74	91
Punjab	C	18	7									1				1	1	
Rangoon	C	4	4	2	1	1			3	2	1				2		4	4
Tuticorin	C		12	3														[1] 2
India (French):																		
Chandernagor Territory	C			5	9								3	2	2			
Karikal Province	C	69	4	96	96	5	5	5	1			2	1					
Pondichery Province	C		10			6	7			1								

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937 6	13	20	27	March 1937 6	13	20	27	April 1937 3	10	17	24	May 1, 1937
Indochina (see also table below): Cochinchina—																		
Chaudoc	C										P							
Cholon Province	C				1											P		
Vinlong	C			1														
Philippine Islands: Manila	C																1	
	D																1	
Siam:																		
Bangkok	C			2	150	52	40	37	34	37	39	57	93	125	167	305	351	178
Provinces	C	18		196	855	252	385	305	397	275	265	465	480	301	500	448	397	286
On vessels:																		
S. S. *Kedah* at Singapore from Penang	C														1			
S. S. *Hellas* at Bangkok from Swatow	C															3		
	D															2		

Place		November 1936 1–10	11–20	21–30	December 1936 1–10	11–20	21–31	January 1937 1–10	11–20	21–31	February 1937 1–10	11–20	21–28	March 1937 1–10	11–20
Indochina (French) (see also table above):															
Cambodia [1]	C				1									2	6
	D				1									2	6
Cochinchina [1]	C		1			1				1				2	
	D		1			1				1				2	

[1] Reports incomplete.

PLAGUE [1]

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937				March 1937				April 1937				May
						6	13	20	27	6	13	20	27	3	10	17	24	1, 1937
Algeria:																		
Algiers	C			[2] 1														
Plague-infected rats		2																
Argentina. (See table below.)																		
Belgian Congo	C	[2] 2																
Bolivia. (See table below.)																		
Brazil. (See table below.)																		
British East Africa:																		
Kenya	C	16	18	8	20		2	5		2	1	1			3			
Tanganyika	C					34	21	19	10			4	6	8	5	16		
Uganda	C	81	85	52	36	6	9	7	10	5	12	7	17	6	6	7		
	D	79	76	50	34	6	9	7	10	4	8	6	17	5	5	7		
Ceylon:																		
Colombo	C	3	4	3	3	3	4	2	1	3	1		2					1
	D	1	3	3	3	3	3	2	1	3	1		2					1
Plague-infected rats		7	1	4	12		6	9	2	2		1			1		1	1
China:																		
Amoy	C													[3] 1	1			
Fukien Province	D													130				
Hainan Island	C												P					
Dutch East Indies:																		
Java and Madura	C	391	317	452	583	137	145											
	D	391	315	452	577	138	145											
Java—Batavia	C														[4] 1			
Ecuador (see also table below):																		
Babahoyo	C		5	2	3		1											
Plague-infected rats			6															
Bajada del Morro	C	3	4															
Guayaquil	C	5	21	13	17	9	5	2	10	7	5	9	12	5	4	7	1	5
	D	1	14	13	11	5	5	3	3	6	4	6	8	5	4	6	1	2
Plague-infected rats		4	7	8	10	7	9	3	14	5	7	5	16	13	7	9	8	4
Playas	C			11	1													
Egypt:																		
Alexandria: Plague-infected rats		P	P															
Asyut Province	C	[5] 3	1	2	2		1						2	16	18	10	4	7
Beheira Province	C	1																

[1] Including plague in the United States and its possessions. [2] Suspected. [3] Imported, pneumonic plague. [4] Imported. [5] Includes 1 case of pneumonic plague.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended—February 1937 6	February 1937 13	February 1937 20	February 1937 27	March 1937 6	March 1937 13	March 1937 20	March 1937 27	April 1937 3	April 1937 10	April 1937 17	April 1937 24	May 1, 1937
Egypt—Continued.																		
Dakahliya Province	C														1			
Girga Province	C	1	1							1				1				2
Formosa: Taihoku District	C			1														
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District:																		
Hamakua Mill Sector		2										1						
Kukaiau					1													
Paauhau Sector [6]		12	3	5	9	2	2	2		1	2	2			1	1	2	2
Pohakea												1						
Maui Island—Wailuku District—Keahua Region		1																
India	C	2,292	2,335	3,029	5,118	975	1,245	1,314	1,397	1,843	1,563	1,405	1,169					
	D	684	717	1,099	2,006	450	671	752	655	825	838	701	612					
Bassein	C		1	1	3	1		4	2	2	1	2		1		2	5	2
Plague-infected rats		1							1	1			1		1	1		
Bombay Presidency	C	109	57	105	139	51	27	28	14	31	19	19	14					
	D	66	35	50	86	26	11	15	10	15	8	8	9					
Central Provinces and Berar	C	1,445	1,376	1,592	2,022	235	388	351	640	806	458	527	422	388	317	213	185	182
Karachi	C					1	4	1	1			1	2	2		3		1
Plague-infected rats																	1	
Madras Presidency	C	48	29	131	97	23	42		29	23	32	24	18	30				
	D	25	15	80	55	13	25		19	8	17	17	12	16				
Punjab	C										1						1	
Rangoon	C	1			3			1		1				2	1			1
Sind State	C						5		1	1	1	2		2	1	3		1
Indochina (see also table below): Bentre	C				1													
Iraq: Baghdad Province	C	1																
Madagascar. (See table below.)																		
Malta	C	[2] 3	6		6												1	
	D				1													
Plague-infected rats					1													
Northern Rhodesia	C				8		1											
Peru. (See table below.)																		
Senegal:																		
Dakar	C														1			
Tivaouane	C																	1

Tunisia: Tunis	C	5	1	1												1	16	
Plague-infected rats				3	1													
Union of South Africa (see also table below)	C	3	3	5	[7] 2		[7] 3		[7] 1				[7] 3		[7] 1			
United States:																		
California:																		
Eldorado County—Plague-infected chipmunk		1																
Monterey County.[8]																		
Placer County.[8]																		
San Bernardino County.[8]																		
Oregon:[9]																		
Grant County[9]—Plague-infected ground squirrel.																		
Lake County[9]—Plague-infected fleas.																		
On vessel: S. S. *Magister* at Kingston from Maranhao, Para, and Manaos	C												1					

Place		October 1936	November 1936	December 1936	January 1937	February 1937	March 1937
Argentina:							
Buenos Aires—							
Plague-infected rats		4					
Catamarca Province	C	1					
Cordoba Province	C		4	5			1
Salta Province	C				2		
San Luis Province	C			1			
Bolivia: Chuquisaca Department	C				P	5	[10] 3
Brazil:							
Ceara State	C				1		
Parahyba State	C				4	1	
Pernambuco State	C					2	
Ecuador (see also table above):							
Manabi—							
Bahia	C					4	7
Manta	C					8	12

Place		October 1936	November 1936	December 1936	January 1937	February 1937	March 1937
Indochina (see also table above):							
Cambodia	C			1			1
Cochinchina	C			1	1		
Madagascar (central region)	C	160	186	176	[11] 170	[12] 219	
	D	154	174	167	161	199	
Peru	C	16	33	16	23	23	28
Cajamarca Department	C		9				1
Lambayeque Department	C	1	3	1	2	4	
Libertad Department	C	6	19	14	15	12	12
Lima Department	C	9	2	1	4	5	1
Lima City	C					1	
Piura Department	C				2	2	14
Union of South Africa (see also table above)	C	11	5	2	2	3	

[3] Suspected.
[6] During the week ended May 15, 1937, 2 plague-infected rats were reported in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory.
[7] For 2 weeks.
[8] Plague-infected fleas have been reported in California as follows: According to information dated Nov. 10, 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley, in San Bernardino County, have been proved positive for plague. A report dated Oct. 13, 1936, states that fleas from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague-infected.
[9] Plague-infection has been reported in Oregon as follows: During the week ended May 15, 1937, 1 plague-infected ground squirrel in Grant County; during the week ended May 8, 56 plague-infected fleas taken from 36 ground squirrels in Lake County.
[10] Pneumonic plague.
[11] Includes 44 cases of pneumonic plague.
[12] Includes 66 cases of pneumonic plague.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937				March 1937				April 1937				May
						6	13	20	27	6	13	20	27	3	10	17	24	1, 1937
Algeria:																		
Algiers Department	C				2													
Oran Department	C									2								
Southern Territories	C													2				
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia	C	99	38	20	14	3	2	1	1	1	2	1	2	3				
Porto Alegre (alastrim)	D	4		1	1													
Recife (alastrim)	C	3	3	15		1				3								
Rio de Janeiro	C				3													
British East Africa: Tanganyika	C	453	207	4	382			66	56	6	49							
Canada:																		
Alberta	C		4	[1] 4	2		[1] 46								[1] 1			
British Columbia	C				[1] 1													
Manitoba	C												[1] 1					
Saskatchewan	C						[1] 1											
Ceylon: Colombo	C	1							1									
China:																		
Amoy	C				3							1	2	1				
Canton	C			2		1	1	2			3							
Dairen	C			1	2		1	2	3			1						
Foochow	C		P	P	P			P		P		P		P		P		
Hangchow	C			1	5	1			2			1						
Hankow	C			5	7			1	4	1	1	4	2	2				
Hong Kong	C				7		2	1	2	2	1	1	3	6	18	5	3	7
Macao	C									1		1						
Nanking	C	1	1	3	2	2	3		2	1	1	3	2	1				
Shanghai	C	7	24	98	231	40	19	40	28	25	32	25	14	14	11	11	19	8
Swatow	C										[2] 1	1	1	1				
Tientsin	C	2	1	4	2		7	3	1		1		4					
Chosen. (See table below.)																		

Colombia	C	84																
Barranquilla	D	1	3	7	1	1	1		1				2	1				
Dahomey. (See table below.)																		
Dutch East Indies: Java—Surabaya	C				[2] 1													
Ecuador: Guayaquil	C	3	8		10	5	8	8	12	23	24	12	14	7	11	7	9	4
Egypt:																		
Alexandria	C		[2] 1															
Qena Province	C												1					
Eritrea (see also table below)	C								3	102			1			1	8	
Estonia	C														2			
Ethiopia	C		13															
Finland. (See table below.)																		
France. (See table below.)																		
Gambia:																		
Bathurst	C										[2] 4							
MacCarthy Island	C										4							
Great Britain: England and Wales—																		
Derby	C										1	1						
Lancaster—Failsworth	C				2													
London and Great Towns (Oldham)	C		1	7														
Ripley	C										1							
Greece: Salonika	C	40	34	38	10		5	5	5		6	6	6	6	8			
Guatemala. (See table below.)																		
Honduras: Puerto Castilla	C															1		
India	C	2,388	3,559	4,605	10,849	3,418	3,492	3,835	3,016	3,439	3,018	3,358	2,777					
	D	582	868	1,136	2,740	742	799	908	770	894	755	741	615					
Assam	C	64	36	154	212	47	78	60	35	49	51	29	34	64	51	42	47	88
Bassein	C				18													
Bombay Presidency	C	183	116	170	671	263	217	242	183	145	195	242	200					
	D	41	27	30	99	43	24	36	43	23	38	37	38					
Bombay	C	11	3	7	25	8	17	11	13	13	16	9	25	38	21	33	44	40
	D	6	3	3	17	6	7	7	9	10	14	6	18	19	13	18	18	28
Calcutta	C	12	8	9	29	13	17	25	31	23	21	21	22	17	15	17	8	22
	D	7	2	7	12	7	11		16	21	18	13	16	14	16	10	11	16
Central Provinces and Berar	C	46	38	115	235	53	97	81	68	76	64	124	77	136	136	124	109	130
Chittagong	C	3	[2] 2	10	237	67	62	28	51	24	11	13	7	5	[2] 1	5	1	1
Cochin	C														47			1
Karachi	C		[2] 1	8	40	8	9	14	18	20	11	7	2	17	1	5	5	12
Madras Presidency	C	470	298	161	671	188	228		163	236	106	175	115	161				
	D	96	59	37	131	27	26		31	29	30	41	18	26				
Madras	C	1	3	7	3	4	6	13	14	8	3	5	8	7	5		12	9
Moulmein	C	3	12	31	48	14	19	16	15	16	8	12	12	3	2	1	2	
Northwest Frontier Province	C	14	15	57	125	12	27	23	23	11	15	15	14	11	10	9	19	15
Orissa Province	C			376	681	226	289	275	259	186	257	233	172	166	204	131	265	126
Punjab	C	77	294	499	533	95	168	80	147	249	156	75	72	77	111	107	105	
Rangoon	C	10	11	2	5	5	3	5	1		2	1	2	5	[2] 1	2	1	1
Sind State	C	21	52	180	195	36	73	22	53	38	28	77		36	96	38	93	3
Vizagapatam	C	1				1			2	1								

[1] For 2 weeks.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937				March 1937				April 1937				May 1, 1937
						6	13	20	27	6	13	20	27	3	10	17	24	
India (French): Chandernagor Territory	C										2							
India (Portuguese)	C	7		2														
Indochina (see also table below):																		
Pnom-Penh	C	4	5	1											1			
Saigon-Cholon	C				2	2												
Tourane	C				3	1			2		2		2	1	1	1		
Iran	C	2	1	1	11	3	2	3	2						2			
Teheran	C	4	2	1		2					1	1						
Iraq	C	3	6	30	1		1							6				
Japan:																		
Kobe	C												[2] 1					
Moji	C											1		2		6	2	1
Osaka	C	16																
Tokyo	C		1															
Yokohama	C						1											
Mexico (see also table below):																		
Chihuahua	C					[3] 3												
Durango	D			1	2			1		4	2	1	3	2		4	2	2
Guadalajara	D															1		
Mexico, D. F.	C	1	2	2	7		3	1										
Monterrey	C				2	4	1	5	1	1				3				
Torreon	C	13	2	3	31			2	5				1	2	2	5	2	
Morocco. (See table below.)																		
Nicaragua: Puerto Cabezas	C								2									
Nigeria	C	98	12	[1] 11	300	19				[4] 321	85							
Lagos	C	1				1												
Northern Rhodesia	C		91															
Nyasaland. (See table below.)																		
Palestine. (See table below.)																		
Peru. (See table below.)																		
Poland	C					1												
Portugal (see also table below):																		
Lisbon	C				2		1			1		1				1		
Oporto	C				1				1									

Siam: Tak Province	C							26					1		4	1	2	
Sierra Leone	C	28	16	38	88		[1] 9		[1] 3									
Freetown	C			3			1											
Southern Rhodesia	C	P		10											1			
Sudan (Anglo-Egyptian)	C	96	113	116	37	18	23	12	22	1	1	5	5			1	1	7
Tunisia	C				1	2			103									

[1] For 2 weeks. [2] Imported. [3] For 7 weeks. [4] For 4 weeks.

On vessels:

S. S. *Jaldurga* at Rangoon from Gopalpur	1 case	Dec. 30, 1936
S. S. *Egra* at Rangoon from Calcutta	1 case	Jan. 4, 1937
S. S. *Tango Maru* at Singapore from Japan	1 death	Jan. 16, 1937
S. S. *Juna* at Rangoon from Penang	1 case	Jan. 27, 1937
S. S. *Horai Maru* at Moji from Keelung	2 cases	Jan. 28, 1937
S. S. *Tjibadak* at Surabaya from Shanghai	1 case	Jan. 28, 1937
S. S. *Colorado Springs* at Manila from Shanghai	1 case	Feb. 1, 1937
S. S. *Nikko Maru* at Moji from Tsingtao	1 case	Feb. 7, 1937
S. S. *Bhadravati* at Bombay from Vengurla	1 case	Feb. 18, 1937

On vessels—Continued.

S. S. *Nagasaki Maru* at Nagasaki from Shanghai	1 case	Mar. 8, 1937
S. S. *Kiangsu* at Swatow from Bangkok	1 case	Mar. 13, 1937
S. S. *Sumatra* at Calcutta	2 cases	Mar. 21, 1937
S. S. *Daviken* at Hong Kong	1 case	Mar. 31, 1937
S. S. *Talma* at Hong Kong	1 case	Apr. 1, 1937
S. S. *Taksang* at Hong Kong	1 case	Apr. 13, 1937
S. S. *President Hoover* at Yokohama from Honolulu	1 case	Apr. 17, 1937
S. S. *Hydri* at Karachi	1 case	Apr. 24, 1937

Place		October 1936	November 1936	December 1936	January 1937	February 1937	March 1937
Angola	C	124	25	24			
Argentina:							
Corrientes Province	C	1		1			
Entre Rios Province	C	154	18				
Los Andes Territory	C	12					
Salta Province	C	31		2			
Belgian Congo	C	110	117	98	111	158	
Bolivia	C				28	4	5
Chosen	C	2		2	1	41	
Dahomey	C			11			
Eritrea (see also table above)	C			1			
Finland	C			1	1	1	
France	C	1	10				1
Guatemala	C	1	1	4	5	2	
Indochina (see also table above)	C	39	159	219	306	382	505
	D	12	33	38	84	70	97
Mexico (see also table above):							
Aguascalientes State—Aguascalientes	C				1	1	
Colima State	C					2	
Mexico—Continued.							
Jalisco State—Guadalajara	C				1	1	
Mexico State	C	1					
Mexico, D. F.	C	6					
Mexico City	D	1	1	2	5	2	
Morelos State	C				4		
Nayarit State	C				1		
Nuevo Leon State—Monterrey	C					6	
Puebla State—Puebla	C				1		
San Luis Potosi State—San Luis Potosi	C				1	1	
Sonora State	C	1					
Morocco	C			2	6	6	
Nyasaland	C		5				
Palestine	C				2	8	
Peru	C	24	13				
Portugal (see also table above)	C	82	126	162	113	59	
	D	7	5	8	3	6	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937 2	9	16	23	30	February 1937 6	13	20	27	March 1937 6	13	20	27	April 1937 3	10	17
Algeria:																				
Algiers Department	C	3	4	19	3	9		[1] 49	10		[1] 68	40	20	5	41	14	24	16	19	35
Algiers	C	1	4	1				1			[1] 2			1	1		1	2		2
Constantine Department	C	10	36	98		19		[1] 94	46		[1] 98	9	32	36	30	66	73	64	128	70
Bone	C		1					[1] 1	1		[1] 10					3				2
Constantine	C		3	3																
Philippeville	C			1				[1] 4	2							1				
Oran Department	C	1			2			[1] 4	4			12	52	67		5			2	2
Southern Territories	C								5		3	6		2						1
Arabia: Aden	C													[2] 1						
Australia: Sydney	C		1														1			
Basutoland	C	1																		
Bolivia. (See table below.)																				
Bulgaria. (See table below.)																				
Ceylon: Colombo	C	1																		
Chile	C	577	435	385																
Santiago Province	C	[3] 152	[1] 87	242																
Valparaiso	C	6	12	21	2		2	4	2	2	1	3	4	11	11	10	5	9	14	9
China (see also table below):																				
Dairen	C		1	4				1												
Hankow	C				1	1														
Shanghai	C	2												1						
Swatow	C											1								
Tientsin	C	1							1				1	1						
Tsingtao	C			3								1	1							
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	2		1	1			4	5	1	5	3		1	2	1	1	1		1
Aswan Province	C													1	6					
Asyut Province	C	1								1		1			5					
Beheira Province	C				1	7				24	7	29		2	16					
Cairo	C	4	1									1	3	2	5	3	1	3	1	6
Dakahliya Province	C									5	4	16		7	8					
Faiyum Province	C			1	1															

Gharbiya Province	C	2		3		5				8	3	9		8	4					
Girga Province	C			2																
Minufiya Province	C				1					5	4	11			6					
Minya Province	C				1					19	1	1								
Port Said	C			2	3	2		2	1	1										
Qena Province	C					1														
Sharkiya Province	C				1									1						
Provinces	C	12	15	14	6	13	25	49	21	62	19	69	25	19	50	35	19	24	36	60
Eritrea: Asmara	C						13		1		1								2	2
France. (See table below.)																				
Greece (see also table below): Salonika	C	5	4	4	1															
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	12	7	2	2	1	2									1		1		
Hungary	C											7				1	11			
Iran	C	3	2	4					7		14	4	1		1	9	1		6	
Teheran	C			1			2					3								
Iraq: Baghdad	C						1											[2] 5		
Irish Free State: Kerry County—																				
Cahirciveen	C												4					4		
Dingle	C	2																		
Italy: Catania	C		1																	
Lithuania. (See table below.)																				
Mexico (see also table below):																				
Mexico, D. F.	C	16	7	4	6	4			2	2	8	8	2							
Saltillo	D	1																		
San Luis Potosi	D		1	1	1	1														
Torreon	C	2																	1	
Morocco (see also table below)	C			1	1	2	1		1	6	6	3	7	5	7	7	5	30	28	23
Palestine:																				
Haifa	C	10	7	11		1		1	1		1			1					1	
Jaffa	C	12	7	8	1		1							1	1			2	1	
Peru. (See table below.)																				
Poland	C	63	131	175	49	58	77	87	128	88	88	146	163	101	140	100	121	161	169	136
	D		6	13	4	6	2	5	5	6	5	7	8	7	7	13	6	9	12	7
Rumania. (See table below.)																				
Sierra Leone: Freetown	C		1						1		1									
Straits Settlements: Singapore	C				1															
Sudan (Anglo-Egyptian)	C			8																
Syria	C																		1	
Trans-Jordan	C											3		1					1	2
Tunisia:																				
Tunis	C	2	3		1	2	2		2	2	3			2		1	1		1	3
Provinces	C	27	43	54	[1] 54	41	73	40		50		94	103	138	119	168	125	79	102	133
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessel: At Santos	C															P				

[1] For 2 weeks.

[2] Imported.

[3] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		October 1936	November 1936	December 1936	January 1937	February 1937	March 1937
Bolivia	C				24	25	30
Bulgaria	C			19	19		
China: Manchuria—Harbin	C		1	7	8	35	
Chosen	C	24	30	28	88	149	
Czechoslovakia	C			3	15	12	
France	C		1	1			
Greece (see also table above)	C	11	11	2	7	2	4
Guatemala	C	17	33	28	29	19	4
Lithuania	C	2	2	3	13	10	23
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C	2			2	3	
Mexico State	C	18			8		
	D	1			1		
Mexico, D. F.	C	14			14	18	
Mexico City	D	7	2	5	6	6	
Oaxaca State	C	2				2	
Mexico—Continued.							
Puebla State: Puebla	C	2		9	7	3	
Queretaro State	C	3			1	2	
San Luis Potosi State: San Luis Potosi	C	1	5	7	7		
Morocco (see also table above)	C		1	2	11	22	27
Peru	C	80	60	52			
Rumania	C	60	178	380	941	1,018	
Turkey	C	21	18	21	24	50	68
Istanbul	C	3	4	1	7	3	
Union of South Africa:							
Cape Province	C	75	74	61	52	12	
Natal	C	7	19	4	4	1	
Orange Free State	C	43	9	8	5	11	
Transvaal	C	4	11	6	13	1	
Yugoslavia	C		7	49	159	125	

YELLOW FEVER

indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended— January 1937					February 1937				March 1937				April 1937			
					2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24
Brazil: [1]																					
Acre Territory	D							1		1											
Matto Grosso State [1]	C			1						2	13	4	1	1							
	D				2		1			1	2	2	1			1	1				
Minas Geraes State [1]	C								1	1	1										
	D								1	1	2	4	6	7	5	12	7	3	2		
Parana State	C											2									
Sao Paulo State [1]	C							1	3		1										
	D							1	3		1	2	11	9	1						
Columbia	C			3																	
	D			1																	
Barrancabermeja	C									1											
Intendencia of Meta—																					
Acacias	D		1																		
Quenane	C	1																			
Restrepo	D	2																			
Villavicencio	D	2	1																		
Dahomey	C		1																		
French Equatorial Africa:																					
Brazzaville	D																				[2] 1
Libreville	C															[2] 1					
	D										1										
French Guinea—Macenta	C	1																			
Gold Coast:																					
Aburi.[3]																					
Accra	C							4	1	1	2										
Tamale	C			1																	
Teshi [3]	C							1								1					
Ivory Coast:																					
Adzope	C											3									
Agboville	C															1					

[1] See also reports of yellow fever in Brazil on p. 536 of PUBLIC HEALTH REPORTS for Apr. 23, 1937, p. 657 of the issue for May 14, 1937, and p. 683 of the issue for May 21, 1937.
[2] Suspected.
[3] During the week ended May 8, 1937, 1 case of yellow fever with 1 death was reported in Aburi, Gold Coast, and during the same period 1 case with 1 death was reported in Teshi, Gold Coast.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 27–Oct. 31, 1936	Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Week ended—																
					January 1937					February 1937				March 1937				April 1937			
					2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24
Nigeria:																					
Calabar	C		1																		
Maiduguri	D		1																		
Uyo	C			1																	
Senegal: [4]																					
Bambey	C		1																		
Dakar. [4]																					
Diakhao [4]	C															1					
Fatick. [4]																					
M'Bour	C		[3] 1																		
Thies Circle—																					
Khombole	C	1	1																1		
Thies	C	[3] 1	[3] 1																		
Tivaouane	C																		1		
Sierra Leone	C	1																			
Sudan (French):																					
Katibougou	C	1																			
Koulikoro	C	2																			
Mahina. [5]																					
Segou	C	1																			

[3] Suspected.

[4] Yellow fever has been reported in Senegal as follows: Dakar, week ended May 15, 1937, 1 suspected case; Diakhao, week ended May 1, 1 case, 1 death; Fatick, week ended May 8, 1 case.

[5] During the week ended May 8, 1937, 1 suspected case of yellow fever with 1 death was reported in Mahina, Sudan.

X

UNITED STATES TREASURY DEPARTMENT

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ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

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THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 52 JUNE 4, 1937 NO. 23

SOME EXPERIMENTS WITH RATS AND RAT GUARDS[1]

By O. E. DENNEY, *Surgeon, United States Public Health Service, Chief Quarantine Officer, The Panama Canal*

The migratory habits of rats for purposes of self preservation and propagation have been recorded in history and fiction, and the two instinctive urges are largely responsible for the presence of rats on shipboard.

The knowledge that rats and their parasites are carriers of disease has led to the practice of attempting to prevent rats from entering ships or from leaving alive once they have gone aboard. Among other means of entrance and egress, the ships' mooring lines are considered important avenues, and efforts have been made to render ships' hawsers impassable for rat traffic.

The barrier commonly accepted in present-day shipping circles as effective is a metal disk or cone fitted around the ship's mooring lines and placed several feet away from the side of the ship. No uniform design of rat guard has been internationally adopted; consequently, in the various ports of the world a variety of rat guards is found, some apparently effective and many obviously useless.

The ports of Cristobal and Balboa, at the Atlantic and Pacific ends of the Panama Canal, through which pass ships from nearly all ports of the globe, have offered opportunity to study many kinds of rat guards used by ships at dock or in fueling berths.

Assuming to be sufficient the dictum that "a rat guard shall be a minimum of 3 feet in diameter, shall fit snugly around the hawser, and shall be of metal sufficiently rigid to maintain the guard at right angles to the hawser", it is interesting to observe in how many ways a well-designed rat guard can be improperly set on a mooring line. A poorly designed or improperly made guard may sometimes be effectively set; more commonly, poorly designed and improperly set guards predominate on certain ships until the inspector presents the port requirements with sufficient emphasis.

Dependent upon the size of the ship, anticipated wind, tide, and current action, cables of various sizes are used; and while some rat guards are adjustable to cables of several sizes, many are not. Rarely

[1] Published with the permission of the Governor, The Panama Canal.

does a ship carry a variety of guards with the appropriate-sized cable holes; the results, therefore, are that a guard intended for a steel cable straddles a large hawser (pl. IV, figs. 1, 2, and 3), or the guard intended for a large hawser fits loosely about a small cable (pl. I, figs. 1–6); common deck practice is to stuff a rag in the opening or to tape the line to the proper size, neither of which expedients is generally satisfactory, as wind and ship movement soon dislodge the rag or the guard (pl. I, fig. 6).

The most frequently used rat guards are not designed effectively to surround two hawsers passing through the same hawse hole and leading to the same or adjacent bitts (pl. II, figs. 1 and 2), and rarely, even when properly set, do they withstand the "seesaw" action which tends to spread and warp the otherwise contacting leaves. Sometimes an effort is made to overcome this difficulty by placing two guards in contact on the lines, a solution which is not generally acceptable, since both guards tend to spread and a rat could easily pass through both of them.

A defect common to many guards is the absence of supporting arms or braces to maintain the guard at right angles to its hawser; the guard thus swinging freely, sooner or later becomes fouled and its axis lies nearly parallel to the cable it is supposed to protect (pl. I, figs. 1 and 2).

The accidents which are common to well-designed rat guards when in storage on ship, or when being installed on the lines, most frequently result in bending the leaves so that they do not properly approximate when on the hawser. The conscientious deck hand will correct the defect or report it to his superior.

While mooring lines are guarded to prevent rat traffic, comparatively few people have reported to have seen rats traveling on ships' lines (the writer has not met a ship's officer who related that he himself had seen a rat enter or leave a ship on a line). The purpose of this paper is to present illustrations of ineffective guards as seen on ships at first inspection in the Canal Zone, and photographic evidence of the behavior of the rat on cables and hawsers under conditions somewhat simulating ship and dock-side environment, omitting, unfortunately, that important, and indeed crucial element of darkness, under cover of which the rat does the most unexpected things.

OBSERVATIONS

Setting.—A ship's hawser was suspended between two trees, at about 5½ feet from the ground. At each end of the hawser was placed a Canal Zone standard 3-foot rat guard, to limit the field of observation. The rat guard under study was placed approximately midway and in the shade, in deference to the rat's alleged dislike for sunlight.

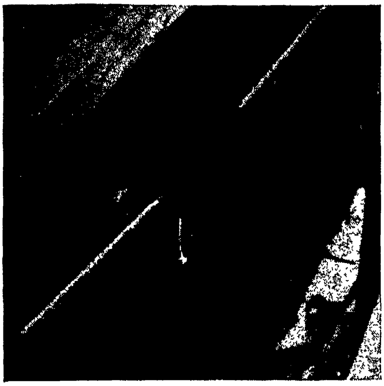

FIGURE 1.

Figure 2.

Figure 3.

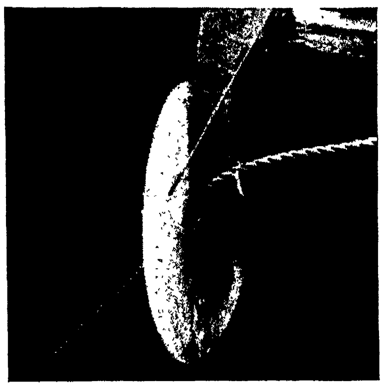

Figure 4.

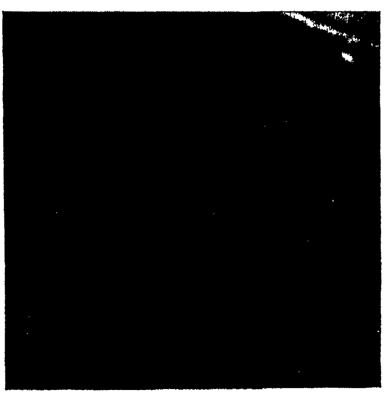

Figure 5.

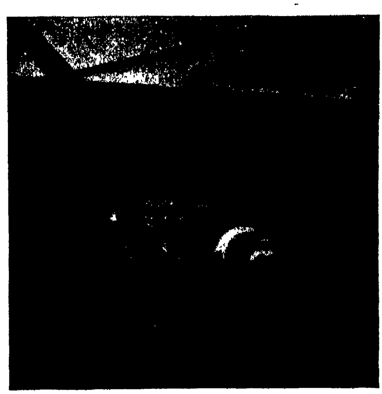

Figure 6.

FIGURE 1. A rat guard on a spring line between ship and dock. The lanyard has fouled, the guard leaves have become separated, and the guard lies upon the hawser almost parallel to it.

FIGURE 2. A rat guard, badly bent, with a 3-inch hawse hole, swinging freely on a steel cable.

FIGURE 3. Rat guard, with 3-inch cable hole, set upon a small hawser. The leaves are not completely closed and the guard is in contact with the anchor.

FIGURE 4. Same guard as shown in figure 3.

FIGURE 5. Guard with cable hole too large for line; leaves incompletely closed and dangling freely on stern line.

FIGURE 6. Large rat guard on three cables; the guard has slipped off the taping, which at first closed the hawse hole.

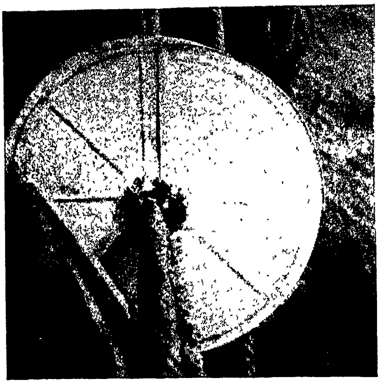

Figure 1.

Figure 2.

Figure 3.

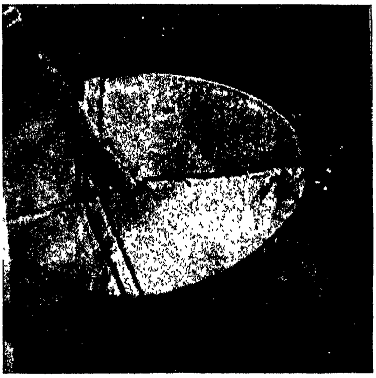

Figure 4.

Figure 5.

Figure 6.

FIGURE 1. Guard attached to two hawsers; the projecting arms, which would close the hawse hole on a single line, could not be completely closed around the two cables.
FIGURE 2. Two rat guards set upon two parallel hawsers. The hawse hole is not large enough to accommodate both lines, and the leaves cannot be closed.
FIGURE 3. Guard with projecting arms untied, leaving the hawse hole unguarded.
FIGURE 4. Rat guard on spring line between ship and dock. Hawse hole is too large, the leaves are not closed and when swinging in a nearly horizontal position the periphery of the guard contacted the dependent cable.
FIGURE 5. A rejected rat guard (left) and a Canal Zone guard (right) on the same hawser.
FIGURE 6. An improvised rat guard consisting of a lifeboat bumper stuffed in a hawse hole. Movement of the ship and the cable has dislodged the bumper.

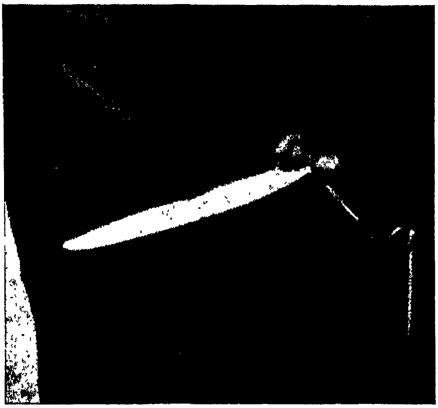

Figure 1.

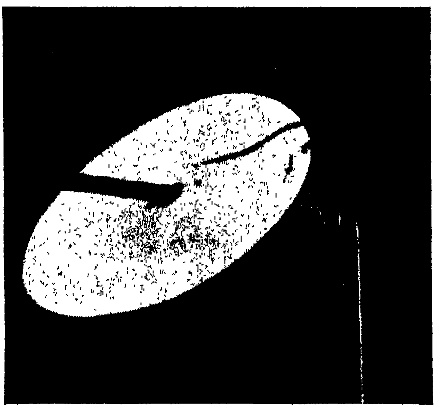

Figure 2.

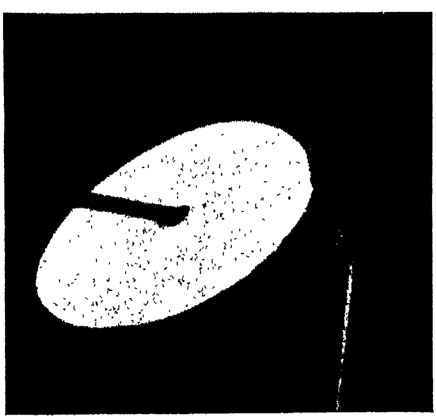

Figure 3.

FIGURES 1, 2, and 3. Rat readily passing across a tilted rat guard. (See pl. I, figs. 1 and 2.)

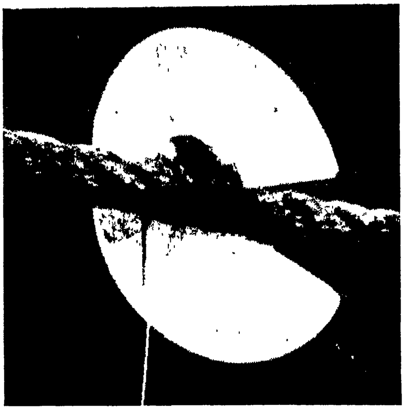

Figure 1.

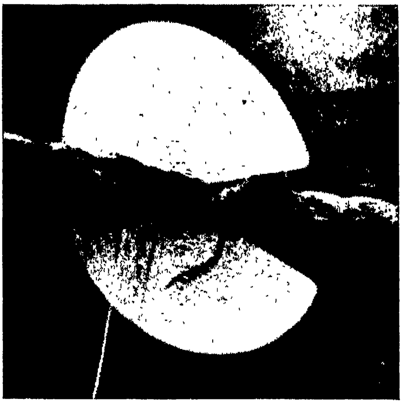

Figure 2.

Figure 3.

FIGURES 1, 2, and 3. Rat passing back and forth through opening between leaves of a rat guard with cable hole too small to permit proper adjustment. (See pl. II, fig. 2.)

Figure 1.

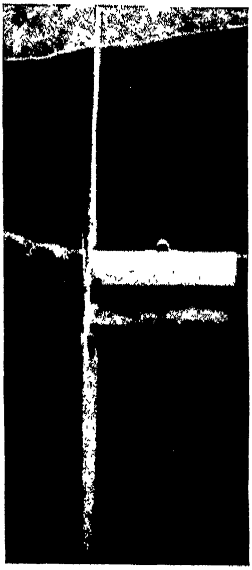

Figure 2.

Figure 3.

Figure 4.

Figure 5.

Figure 6.

FIGURES 1–6. Rat passing readily back and forth through a Canal Zone rat guard, with purposely unclosed hawse-hole guides. (See pl. II, fig. 3.)

Figure 1.

Figure 2.

Figure 3.

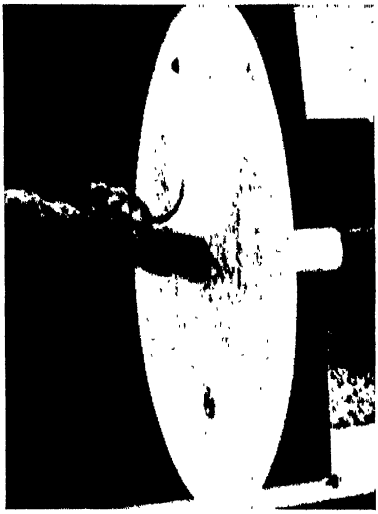

Figure 4.

FIGURE 1. Rat scaling a Canal Zone rat guard by climbing up the leaf edge.
FIGURE 2. Rat perched on the rim of the guard preparatory to leaping to the cable.
FIGURE 3. Rat in mid-air, in act of leaping.
FIGURE 4. Rat landing on cable, at instant of impact.

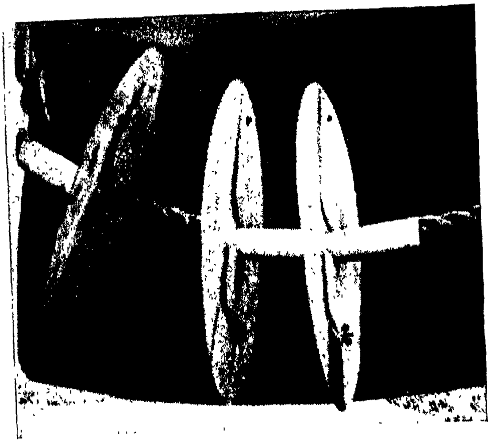

FIGURE 1. Three Canal Zone guards placed close together. The rat, when placed between the two right-hand guards, scaled the middle one and leaped 9 inches to the guard on the left.

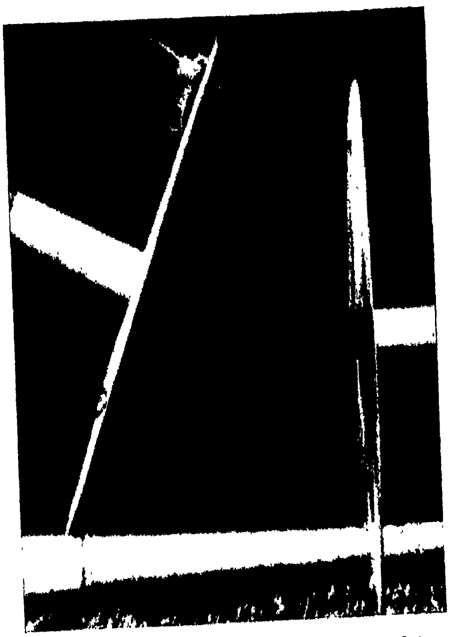

FIGURE 2. On the first leap, the rat jumped completely over the left guard, touched the cable, and fell to the ground. On a second trial, here shown, he slightly overjumped and slid safely to the cable. On the third and subsequent trials he landed on the rim of the guard, striking on his belly, checked his momentum with his hind legs, completed the descent at his leisure.

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Figure 1.

Figure 2.

Figure 3.

FIGURE 1. Having learned to circumvent the 3-foot guards, the rat staged his temporary escape by scaling the guard after circling the cable several times in search for an open around the cable.

FIGURE 2. Running back and forth on the edge of the guard leaf.

FIGURE 3. Perched on the top of guard rim preparatory to a successful leap into the tree above, the nearest leaf of which was 6 inches over his head.

The rat was placed on the hawser, and performance was stimulated when necessary by tapping on one of the terminal rat guards with a stick; the noise was sufficiently alarming to cause the rat to make efforts to escape.

Observation No. 1 (pl. III, figs. 1, 2, and 3).—A rat guard with a large hawser hole was placed on a 1-inch steel cable, the lanyard was snarled and the guard was tilted to about the same angle as seen in plate I, figures 1 and 2. An adult, male, *Rattus alexandrinus*, when placed on the cable, unconcernedly passed back and forth over the rat guard, balancing himself appropriately as the guard tilted under his shifting weight.

Observation No. 2 (pl. IV, figs. 1, 2, and 3).—A rat guard with a small hawser hole (1½ inch) was placed on a 3½-inch hawser, leaving a triangular opening at the side, resembling the situation shown in plate II, figure 2. The rat passed through the guard repeatedly and without reference to the location of the triangular opening.

Observation No. 3 (pl. V, figs. 1 to 6).—A Canal Zone standard guard was placed on a 3½-inch hawser, and the adjustable hawser hole arms were purposely left partly open. The rat, after a rapid survey of the situation, entered the space below the cable and passed readily through the hawser hole.

Observation No. 4 (pl. VI, figs. 1 to 4).—A Canal Zone standard guard was properly set on the 3½-inch cable and the rat, after encircling the cable several times, apparently searching for the hawser hole through which he had previously passed, proceeded to climb the guard, and perched himself on top. After carefully washing his paws, he crouched and leaped from the rim of the guard to the hawser, making a perfect landing and proceeding to the next guard. Once the journey had been accomplished, the rat repeated the scaling of the guard, paying little attention to the position of the overlaps of the metal leaves, without which he could not have made the perpendicular climb.

Observation No. 5 (pl. VII, figs. 1 and 2).—Three Canal Zone standard guards were placed almost in apposition, and the rat was placed between two of them. He quickly scaled the middle guard and perched upon the rim. After a brief survey of the situation, and considerable paw washing, he made a leap for the outer guard, overshot his mark and fell to the ground. After a pause to permit himself to recover his poise, he was again placed between the same guards, and without hesitation again climbed to the rim of the middle guard; then, again, after repeating the circus performer's maneuvers, he made the leap—9 inches in the clear—and landed neatly on the rim of the outer guard, his momentum causing him to slide forward on his abdomen until checked by his hind legs. The descent from the rim to the cable was, as usual, a short, clean leap.

While the observers were discussing means of inducing the rat to jump two guards, the performer became his own director and proceeded to scale the last guard (pl. VIII, figs. 1 and 2); and then, with very little preliminary clowning (pl. VIII, fig. 3), he leaped to the branches of the tree (6 inches in the clear) and disported himself for a time unmolested.

SUMMARY AND COMMENT

For many years ships' mooring lines were protected from rat traffic by smearing tar on the hawsers. In more recent years some degree of protection has no doubt been obtained from metal disks or cones placed upon the hawsers, the theoretical efficiency of such guards obviously depending, to some extent, upon the manner in which the guard is set and maintained. The writer has seen improperly set and poorly designed and constructed rat guards in many ports, and submits photographs of some seen in routine port inspection in the Canal Zone.

That rats board ship by way of the mooring lines is difficult to demonstrate because the excursions are believed to be made under cover of darkness; but the fact has been accepted almost universally for centuries.

To determine the capacity of the rat to circumvent obstacles on hawsers, and to record his methods of approach, a photographic study was made. A male adult black rat was selected, as notoriously the best climber. The rat was introduced to his tasks by gradually making them more difficult; and it cannot be denied that he gained in experience as the observations continued. The ease, however, with which he crossed over a standard, rigid, 3-foot rat guard, caused, to say the least, considerable concern in the mind of the observer, and stimulated thought regarding the resourcefulness of this animal and the design and efficiency of rat guards.

CONCLUSION

A poor rat guard will not deter a rat, and the usually accepted type of guard probably will not deter a determined rat in the presence of an active migratory urge.

A NEW SPECIES OF THRASSIS (Siphonaptera)*

By WILLIAM L. JELLISON, *Assistant Parasitologist, United States Public Health Service*

A species of Siphonaptera represented by a large series of specimens from ground squirrels, *Citellus* spp., indigenous to several Western States, appears to be new and is described below.

* Contribution from the Division of Infectious Diseases, National Institute of Health, Rocky Mountain Laboratory, Hamilton, Mont.

Thrassis pandorae [1] n.sp.

Holotype, male, *allotype*, female, from *Citellus elegans*, P. & O. Ranch, Beaverhead County, Mont., deposited in the collection of the Division of Infectious Diseases of the National Institute of Health, Rocky Mountain Laboratory, Hamilton, Mont. There are numerous paratypes of both sexes collected by the writer from *C. elegans* in Beaverhead and Madison Counties and from *C. armatus* in Beaverhead County, Mont., and others collected by field crews of the San Francisco Plague Laboratory of the United States Public Health Service from *C. oregonus* in Grant and Wallowa Counties, Oreg., and by Laboratory Assistant E. W. Malone, of the Rocky Mountain Laboratory, from *Citellus* sp., in Natrona County, Wyo. Paratypes of both sexes have been deposited at the National Museum and the National Institute of Health, Washington, D. C., Stanford University, and the University of Minnesota.

Male and female.—Close to *Th. petiolatus* (Baker) 1904, but best distinguished by modified abdominal segments.

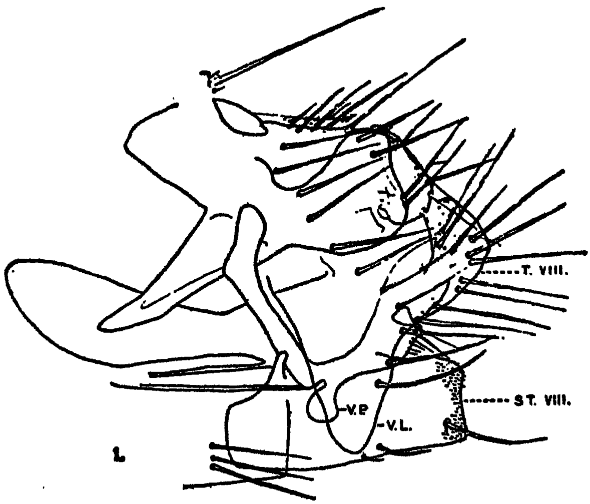
Head.—Frontal tubercle present, not prominent. Three bristles in oral row, middle one reduced and closest to upper bristle. Dorsal and ventral margins of antennal groove bordered with a row of minute setae. Row of long bristles on second segment of antenna. Rostrum 5 segmented and extending slightly beyond forecoxae.

Thorax.—Pronotal ctenidia of 15 spines. Outer surface of forefemur with fine lateral bristles, thin bristles on inside of mid and hind coxae from base to apex. Longest apical spine of segment 2 of hind tarsus reaching middle of segment 5. Five pairs of plantar bristles, all marginal.

Abdomen.—Typical abdominal tergites with two rows of bristles. One or two apical spinelets on tergites 1 to 4.

Male.—Antennal groove reaching to vertex of the head. The modified abdominal segments are illustrated in figure 1. Eighth tergite large, extending posteriorly beyond other modified segments, ventral lobe extending below eighth sternite in many specimens, narrower than in *petiolatus*. Bears a dorsal row of 7 to 9, a posterior marginal row of 10 to 12, submarginal group of 3 to 5, and anterior row of about 8 long bristles. Eighth sternite rectangular, three times longer than wide. Distal portion membraneous and finely spiculose as found only in *petiolatus* of this genus. Posterior ventral corner distinctly angular and not rounded or dialated as in *petiolatus*. Posterior bristle on eighth sternite larger than in *petiolatus* and with two or more pairs of fine ventral bristles anterior to it in some specimens, especially in those from Oregon. The ninth sternite bears near its proximal

[1] The name is from classical mythology but is also appropriate as a contraction of P(oindexter) and O(rr) Ra(nch) the type locality of the species and locality where sylvatic plague was first discovered in Montana, July 12, 1935.



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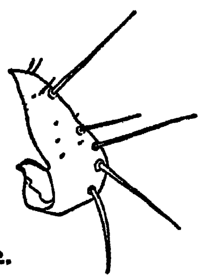

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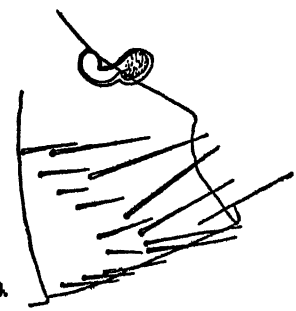

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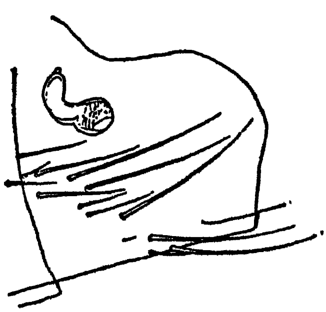

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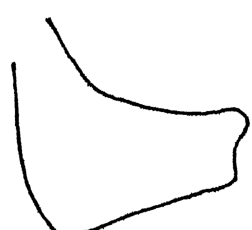

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Explanation of Figures

FIGURE 1.—Genitalia of *T. pandorae* n. sp., male. T. VIII, eighth tergite; St. VIII, eighth sternite; V. L., ventral lobe of eighth sternite; V. P., ventral process of ninth sternite.

FIGURE 2.—Movable process of *T. pandorae* n. sp., male.

FIGURE 3.—Movable process of *T. petiolatus*, male.

FIGURE 4.—Seventh sternite of *T. pandorae* n. sp., female.

FIGURES 5 AND 6.—Dimorphic forms of seventh sternite of *T. petiolatus*, females.

ventral angle a ventral, obovate process which is present in *petiolatus* but more developed and rounded in this species. Movable process of clasper (fig. 2) with distal and proximal sides straight, apex acute,

inclined frontad, ventral margin rounded, distal margin bears several small and 5 medium bristles, lower two largest. Movable process in *petiolatus* (fig. 3) is longer, more crescentic, and narrower at base.

Female.—Head of receptaculum seminis ovate, tail one-half longer than head, with proximal half curved dorsally, bearing a small terminal appendage. Receptaculum is not distinguishable from that of *petiolatus*. The dorsal lobe of the seventh sternite (fig. 4) is angular, that of *petiolatus* is well rounded. Females of *petiolatus* are dimorphic in this respect as illustrated by Jordan.[2] Both types are redrawn (figs. 5 and 6) for convenient reference.

Although the type host of *T. petiolatus* is *Lynx canadensis*, the usual host is quite certainly *Citellus columbianus*, judged by several collections from the type area. In areas in Beaverhead County, where there is a mixed population of *C. elegans* and *C. columbianus*, these two closely related species of *Thrassis* occur on their respective hosts.

The Montana specimens were collected during 1935 and 1936, incident to sylvatic plague studies in the southwestern part of the State. *T. pandorae* was found to be the most abundant of the four species of fleas commonly found on Wyoming ground squirrels in the epizootic area. The Oregon specimens were also collected in epizootic areas. This species, therefore, is of interest as a possible vector of *Bacillus pestis*.

This flea was recognized as a new species by Mr. B. J. Collins, of the Division of Zoology, National Institute of Health, and through his courtesy is being described by the writer.

REPORT ON MARKET-MILK SUPPLIES OF URBAN COMMUNITIES

Compliance of the Market-Milk Supplies of Urban Communities With the Grade A Pasteurized and Grade A Raw Milk Requirements of the Public Health Service Milk Ordinance and Code (as Shown by Ratings of 90 Percent or More Reported During the Period Jan. 1–Apr. 30, 1937)

Following is a supplemental list of urban communities in which the pasteurized market milk is both produced and pasteurized in accordance with the Grade A pasteurized-milk requirements of the Public Health Service Milk Ordinance and Code, and in which the raw market milk sold to the final consumer is produced in accordance with the Grade A raw-milk requirements of said ordinance and code,

[2] Jordan, K.: On some problems of distribution, variability, and variation in North American Siphonaptera. Trans. Fourth International Congress of Entomology, Ithaca, N. Y., August 1928, vol. II, p. 489.

as shown by ratings of 90 percent or more reported during the period January 1, 1937, to April 30, 1937:

TABLE 1.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw-milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more*

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed]

Community	Percentage of milk pasteurized	Date of rating
Chicago, Ill	99.7	Jan. 22, 1937
Bryson City, N. C	50	Jan. 19, 1937
Durham, N. C	89	Apr. 3, 1937
Franklin, N. C	68	Jan. 29, 1937

TABLE 2.—*Communities in which no market milk is pasteurized, but in which the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by raw milk ratings of 90 percent or more*

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed

Community	Date of rating
North Wilkesboro, N. C	Nov. 11, 1936
Wilkesboro, N. C	Do.

For a detailed discussion of the significance of the milk sanitation ratings see Public Health Reports, vol. 52, no. 5, January 29, 1937 (pp. 130–133).

AGE OF GAINFUL FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS OF THE UNITED STATES, 1920 AND 1930[1]

Studies on the Age of Gainful Workers No. 3

By WILLIAM M. GAFAFER, *Senior Statistician, United States Public Health Service*

INTRODUCTION

The previous paper of the series (*1*, *2*) considered the age of gainful male workers in different geographic regions of the United States by occupational group for the census years 1920 and 1930. Regional differences with respect to the number of workers in specific occupational groups were found only in certain age groups; an ordering of the regions with respect to occupational group was, therefore, not possible. The picture for 1920 was, with a few exceptions, similar to that for 1930. The nine occupational groups, generally regardless of region, were observed to be classifiable into four categories depending upon

[1] From the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Washington, D. C.

the particular age groups associated with excesses or dearths of workers, thus: (*a*) Agriculture, forestry, and animal husbandry showed an excess of workers in the early and late age groups and a dearth intervening; (*b*) extraction of minerals, manufacturing and mechanical industries, transportation and communication, and trade showed a dearth in the early and late age groups with an excess intervening; (*c*) public service, professional service, and domestic and personal service showed a dearth in the earlier age groups that gradually reached an excessive number in the late ages; and (*d*) the clerical occupations showed excesses in the early ages that were gradually replaced by a dearth in the older ages.

It is purposed in the present paper to investigate the relation of geographic location of the gainful female worker in different occupational groups to her age, and the effect upon this relation of the passage of 10 years.

The term *gainful worker* as used in this series of papers includes, according to the Bureau of the Census (*3*), " * * * all persons 10 years old and over who usually follow a gainful occupation even though they may not have been actually employed at the time the census was taken. It does not include women doing housework in their own homes without wages and having no other employment, nor children working at home, merely on general household work, on chores, or at odd times on other work."

As in the previous paper the 48 States and the District of Columbia have been divided into four broad groups, each group constituting a geographic region, as follows: Northeastern (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania), Southern (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas), North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas), and Western (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Nevada, Utah, Washington, Oregon and California).[2]

The present inquiry, like the previous ones, makes use of basic data published by the Bureau of the Census in its reports of 1920 and 1930.

FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS BY OCCUPATIONAL GROUP

The number of gainful female workers in each geographic region and their distribution among nine occupational groups are shown for

[2] The four groups of States correspond to the nine groups used in the publications of the Bureau of the Census, thus: Northeastern=New England+Middle Atlantic, Southern=South Atlantic+East South Central+West South Central, North Central=East North Central+West North Central, and Western=Mountain+Pacific.

TABLE 1.—*Gainful female workers 10 years of age and over in different geographic regions of the United States, specific for occupational group, 1920 and 1930*

Occupational group	1920 Northeastern	1920 Southern	1920 North Central	1920 Western	1930 Northeastern	1930 Southern	1930 North Central	1930 Western
	Number				Number			
All groups	2,988,532	2,613,364	2,336,356	611,259	3,577,190	3,162,925	3,011,579	1,000,422
Agriculture, forestry, animal husbandry	29,088	931,811	93,347	29,882	22,614	771,500	82,743	33,411
Extraction of minerals	894	914	747	309	228	188	245	98
Manufacturing and mechanical industries	1,065,035	304,892	483,908	76,596	922,745	384,442	480,282	98,838
Transportation and communication	74,373	39,324	77,841	21,516	101,236	53,736	95,874	30,358
Trade	229,821	125,926	239,928	72,117	302,087	198,411	327,731	134,451
Public service (n. e. c.) [1]	4,409	6,545	7,327	3,513	4,367	4,310	6,068	2,833
Professional service	316,913	224,673	358,693	116,219	481,359	355,079	494,803	194,993
Domestic and personal service	663,165	758,624	593,234	171,901	917,619	1,087,189	878,441	297,002
Clerical occupations	604,834	220,745	481,331	119,206	824,935	308,070	645,392	208,433
	Percent				Percent			
All groups	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, animal husbandy	1.0	35.7	4.0	4.9	.6	24.4	2.7	3.3
Extraction of minerals	(2)	(2)	(2)	.1	(2)	(2)	(2)	(2)
Manufacturing and mechanical industries	35.6	11.7	20.7	12.5	25.8	12.2	16.0	9.9
Transportation and communication	2.5	1.5	3.3	3.5	2.8	1.7	3.2	3.0
Trade	7.7	4.8	10.3	11.8	8.4	6.3	10.9	13.4
Public service (n. e. c.) [1]	.2	.3	.3	.6	.1	.1	.2	.3
Professional service	10.6	8.6	15.4	19.0	13.5	11.2	16.4	19.5
Domestic and personal service	22.2	29.0	25.4	28.1	25.7	34.4	29.2	29.7
Clerical occupations	20.2	8.4	20.6	19.5	23.1	9.7	21.4	20.9

[1] N. e. c.=not elsewhere classified.
[2] Less than 1/10 of 1 percent.

1920 and 1930 in table 1. In 1920 the number of workers in the Northeastern, Southern, and North Central regions ranged between 2 and 3 millions, while in the Western region there were approximately 600,000. In 1930 the order of the regions is undisturbed, each region with the exception of the Western increasing to over 3 millions, and the Western reaching approximately a million.

When the occupational groups of each region are arranged in decreasing order of magnitude with respect to the percentages of workers engaged in the different groups, it will be seen that in 1920 the manufacturing and mechanical industries easily ranked first in the Northeastern region, claiming 35.6 percent of all the gainful female workers of that region; agriculture, forestry, and animal husbandry ranked first in the Southern region with 35.7 percent, a percentage well above the corresponding percentages for the other regions; and domestic and personal service ranked first in the North Central and Western regions with 25.4 and 28.1 percent, respectively. The lapse of 10 years effected small increases in domestic and personal service, this group of occupations ranking first in all regions in 1930, with the exception of the Northeastern, where the manufacturing and mechanical industries decreased sufficiently to become practically tied with domestic and personal service. In 1920 the percentages associated with domestic and personal service ranged from 22 to 29 percent; in 1930, from 26 to 34 percent.

Furthermore, in each region and for both census years the lowest ranking occupational groups were public service and extraction of minerals, the former ranking eighth and the latter last, in ninth place. The percentages for public service in 1930 were consistently less than the corresponding percentages for 1920; for both years the percentages for extraction of minerals were all 0.1 percent or less. It is of interest also to note that the clerical occupations approximated 20 percent in the Northeastern, North Central, and Western regions, respectively, while the same occupations accounted for 8 percent of the female workers in the Southern region; 10 years later there was a slight increase in these percentages.

FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS BY AGE AND OCCUPATIONAL GROUP

The percentage age distribution of the gainful female workers in different geographic regions for 1920 and 1930 according to all occupational groups and for particular occupational groups, respectively, is shown in table 2.

Age distribution regardless of occupational group.—When the percentages constituting the age distributions of workers in all occupational groups, specific for region and census year, are arranged in decreasing order of magnitude certain notable facts are disclosed.

TABLE 2.—*Age distribution of gainful female workers in different geographic regions of the United States, specific for occupational group, 1920 and 1930*

Occupational group	Age group, 1920: 10 years and over	10–17	18–19	20–24	25–44 [1]	45–64	65 and over	Age group, 1930: 10 years and over	10–17	18–19	20–24	25–44 [1]	45–64	65 and over
	Number	Percent						Number	Percent					
	Northeastern							Northeastern						
All groups	2,988,532	10.961	9.977	22.041	39.571	15.417	2.033	3,577,190	6.827	9.974	23.092	41.144	16.674	2.289
Agriculture, forestry, animal husbandry	29,088	4.878	2.248	4.095	24.110	44.121	20.548	22,614	5.351	3.277	5.209	24.122	43.747	18.294
Extraction of minerals	894	21.029	10.850	13.647	35.794	15.884	2.796	228	13.158	11.842	14.035	34.211	22.807	3.947
Manufacturing and mechanical industries	1,065,035	17.017	11.360	20.916	36.538	12.944	1.225	922,745	12.365	12.354	21.488	37.659	14.379	1.755
Transportation and communication	74,373	13.761	18.372	35.069	29.285	3.286	.227	101,236	9.365	15.760	31.322	38.149	5.012	.392
Trade	229,821	11.814	10.085	20.452	41.777	14.556	1.316	302,087	6.659	9.748	19.788	43.193	18.919	1.693
Public service (n. e. c.) [2]	4,409	.658	2.019	10.887	52.075	31.458	2.903	4,367	.252	.641	7.076	45.821	41.012	5.198
Professional service	316,913	.974	4.618	25.166	52.099	15.810	1.333	481,359	.723	4.675	24.893	49.532	18.429	1.748
Domestic and personal service	663,165	4.389	3.843	11.792	44.962	30.031	4.983	917,619	5.203	6.116	14.540	41.849	27.375	4.917
Clerical occupations	604,834	12.417	16.429	33.580	33.522	3.865	.187	824,935	5.824	14.299	34.126	39.425	6.050	.276
	Southern							Southern						
All groups	2,613,364	15.021	8.103	18.519	39.636	15.982	2.739	3,162,925	10.014	7.542	19.772	42.318	17.827	2.527
Agriculture, forestry, animal husbandry	931,811	27.782	7.126	13.013	31.849	16.724	3.506	771,500	24.733	8.175	13.605	29.621	19.710	4.155
Extraction of minerals	914	12.910	8.972	19.475	44.858	12.144	1.641	188	18.085	10.106	14.894	43.617	12.766	.532
Manufacturing and mechanical industries	304,802	15.411	10.431	18.368	40.055	14.129	1.606	384,442	11.994	10.825	20.594	40.440	14.649	1.498
Transportation and communication	39,324	16.667	19.652	31.426	28.013	3.906	.336	53,736	5.747	13.868	31.668	40.235	7.942	.540
Trade	125,926	9.755	9.861	21.243	45.006	12.980	1.155	198,411	5.137	8.064	19.166	46.770	19.313	1.550
Public service (n. e. c.) [2]	6,545	1.253	3.392	15.447	55.569	22.108	2.231	4,310	.557	.766	10.626	56.798	28.654	2.599
Professional service	224,673	1.778	8.792	33.923	44.728	9.857	.922	355,079	.545	4.937	31.792	48.705	12.887	1.134
Domestic and personal service	758,624	6.320	5.849	15.407	46.667	21.889	3.868	1,087,189	5.212	5.892	16.061	47.513	22.241	3.081
Clerical occupations	220,745	7.125	13.134	33.216	41.096	5.042	.387	308,070	2.552	9.342	31.875	48.054	7.817	.360

	North Central							North Central						
All groups	2,336,356	8.768	10.530	23.398	39.816	15.295	2.193	3,011,579	4.512	9.447	23.490	42.455	17.562	2.534
Agriculture, forestry, animal husbandry	93,347	7.471	3.842	6.919	25.576	42.282	13.910	82,743	5.756	3.565	5.753	22.374	45.037	17.515
Extraction of minerals	747	17.537	14.056	21.553	33.467	11.245	2.142	245	9.388	16.735	31.428	29.388	11.837	1.224
Manufacturing and mechanical industries	483,908	14.106	11.590	19.522	38.505	14.766	1.511	480,282	7.048	11.925	21.846	40.671	16.372	2.138
Transportation and communication	77,841	15.101	18.633	31.864	30.325	3.811	.266	95,874	4.988	15.287	32.217	39.482	7.492	.534
Trade	239,928	10.427	10.637	21.544	43.750	12.775	.867	327,731	5.008	9.427	19.174	45.636	19.291	1.464
Public service (n. e. c.) [2]	7,327	.369	2.511	14.549	56.667	24.034	1.870	6,068	.165	.363	9.756	51.318	35.316	3.082
Professional service	358,693	1.294	8.269	31.934	46.358	11.238	.907	494,803	.556	5.606	29.414	48.161	14.796	1.467
Domestic and personal service	593,234	6.870	6.757	14.729	41.631	25.879	4.134	878,441	5.738	7.637	15.413	41.003	25.963	4.246
Clerical occupations	481,331	9.825	15.850	34.507	36.112	3.559	.147	645,392	3.547	12.990	34.460	42.707	6.067	.229
	Western							Western						
All groups	611,259	5.043	7.574	19.591	46.518	19.094	2.180	1,000,422	2.387	6.258	18.863	47.104	22.578	2.810
Agriculture, forestry, animal husbandry	29,882	7.449	2.858	6.305	35.222	39.044	9.122	33,411	7.866	3.580	5.794	29.529	41.142	12.080
Extraction of minerals	309	4.207	4.854	15.858	49.838	22.007	3.236	98	4.082	8.163	10.204	38.776	32.653	6.122
Manufacturing and mechanical industries	76,596	7.602	7.149	12.466	46.147	24.372	2.264	98,838	3.062	6.855	14.484	44.735	27.468	3.396
Transportation and communication	21,516	9.983	18.916	34.668	32.938	3.314	.181	30,358	1.693	10.633	30.450	48.531	8.084	.609
Trade	72,117	6.552	9.191	18.679	48.767	15.637	1.174	134,451	2.350	6.486	15.595	48.614	24.847	2.108
Public service (n. e. c.) [2]	3,513	.028	1.480	10.589	58.896	27.299	1.708	2,838	.810	.458	7.153	53.947	34.285	3.347
Professional service	116,219	1.041	4.647	24.361	53.285	15.439	1.227	194,993	.556	3.539	21.235	52.626	20.118	1.926
Domestic and personal service	171,901	4.805	5.110	11.497	46.043	28.922	3.623	297,002	3.510	5.687	12.770	42.653	30.922	4.458
Clerical occupations	119,206	5.386	12.597	32.626	44.392	4.783	.216	208,433	1.447	9.054	30.081	50.950	8.178	.290

[1] Includes a negligible number of persons of unknown age.
[2] N. e. c.=not elsewhere classified.

Thus, in each region and for both census years, the three ranking age groups are the same and have the same order. These age groups, together with their lower and upper limits irrespective of region and census year, are 25–44 (40 to 47 percent), 20–24 (19 to 23 percent), and 45–64 (middle-aged, 15 to 23 percent); in each instance the upper limit is yielded by the year 1930. The remaining age groups, with the exception of the Southern child group (10–17) for 1920, have less than 11 percent. In 1920 the Southern child group yielded 15 percent, decreasing in 1930 to 10 percent; the corresponding percentages for the Northeastern region read 11 and 7 percent, respectively; the North Central, 9 and 5, and the Western, 5 and 2. It is noteworthy that the old-aged group (65 and ovei), generally ranking last among the different age groups, was represented by between 2 and 3 percent of the workers regardless of region and census year.

Age distribution by occupational group.—It is now pertinent to ask what the order is of the various occupational groups in each age group, how the regions compare, and what the effect is of the passage of 10 years. The questions are asked primarily with respect to the child, middle- and old-aged groups, respectively.

In 1920, according to table 2, all of the occupational groups of the Western region yielded fewer than 10 percent of their numbers to the child group, transportation and communication furnishing almost 10 percent of its workers; 10 years later all of the percentages were less than 8 percent, transportation and communication declining to less than 2 percent, with agriculture, forestry, and animal husbandry holding first place (7.9 percent). In 1920 the Northeastern region yielded five occupational groups, each with more than 10 percent in the child group, while the Southern and North Central regions each showed four groups with more than 10 percent. Ten years later the Northeastern region showed only two occupational groups with more than 10 percent in the child group, the Southern showing three and the North Central none. The largest percentage in the child group was 28 percent associated with agriculture, forestry, and animal husbandry of the Southern region in 1920. The lowest percentages (less than 2 percent) in each region and census year were given by professional service and public service, respectively. In general, the percentages in the child group of 1930 for each region were less than the corresponding ones of 1920; the largest decrease was approximately 10 points, which was associated with transportation and communication in the Southern and North Central regions, respectively.

In 1920 the middle-aged group, 45–64 years, showed, with the exception of the Southern region, agriculture, forestry, and animal husbandry to hold first place, ranging from 39 to 44 percent, depending upon the geographic location of the worker; in the Southern region public service claimed first place with 22 percent. In 1930

these percentages, in general, increased slightly without any change in their relative order. It is noteworthy that domestic service held second place or a position very close to second in all regions and in both census years, while clerical occupations and transportation and communication claimed the lowest places. In general, the percentages in the middle-aged group of 1930 for all regions were greater than the corresponding ones of 1920; the largest increases, approximately 10 points, were connected with public service in the Northeastern and North Central regions, and with extraction of minerals and trade in the Western region.

With respect to the old-aged group, 65 years and over, agriculture, forestry, and animal husbandry generally ranked first among the occupational groups in each region and for both census years. With the exception of the Southern region, the percentages for this group (9 to 20 percent) ranked well above the percentages for the groups in second place. Moreover the percentages for 1930 for all occupational groups were generally slightly higher than the corresponding ones for 1920. With the exception of agriculture, forestry, and animal husbandry, all percentages, regardless of region and census year, were 6 percent or less, with the clerical occupations and transportation and communication generally ranking lowest.

RATIO OF OBSERVED PERCENTAGE OF GAINFUL FEMALE WORKERS IN EACH OCCUPATIONAL GROUP TO THE EXPECTED OR NORMAL PERCENTAGE

The percentage age distribution of all gainful female workers, regardless of occupation but specific for region and census year, may be assumed to be the "expected" or "normal" percentage age distribution for each occupational group specific for region and census year. As a consequence of this assumption eight expected or normal age distributions emerge, each corresponding to a particular region and census year, and the ratios of the observed percentages to their corresponding expected percentages will disclose whether there is a relatively large, a relatively small, or a normal percentage of workers of a particular occupational group in a specific age group of a particular region and census year.

Reference to the expected or normal percentages has already been made in the previous section. Table 3 presents the calculated ratios, and figures 1 and 2 show them graphically. The broken line in each figure drawn through 1.00 indicates the normal or expected level of gainful workers. When the percentage of persons actually observed in a particular age and occupational group for a region is the same as the expected percentage, the bar will reach the broken line. Obviously when the height of a bar is below (or above) the normal level the

TABLE 3.—*Ratio by age and geographic region of the United States of percentage of gainful female workers in a specified occupational group to the percentage for all groups 1920 and 1930 (percentages shown in table 2)*

Occupational group	Age group, 1920						Age group, 1930					
	10-17	18-19	20-24	25-44	45-64	65 and over	10-17	18-19	20-24	25-44	45-64	65 and over
	Northeastern						Northeastern					
Agriculture, forestry, animal husbandry	0.45	0.23	0.19	0.61	2.86	10.11	0.78	0.33	0.23	0.59	2.62	7.99
Extraction of minerals	1.92	1.09	.62	.90	1.03	1.38	1.93	1.19	.61	.83	1.37	1.72
Manufacturing and mechanical industries	1.55	1.14	.95	.92	.84	.60	1.81	1.24	.93	.92	.86	.77
Transportation and communication	1.26	1.84	1.59	.74	.21	.11	1.37	1.58	1.36	.93	.30	.17
Trade	1.08	1.01	.93	1.06	.94	.65	.98	.98	.86	1.05	1.13	.74
Public service (n. e. c.)[1]	.06	.20	.49	1.32	2.04	1.43	.04	.06	.31	1.11	2.46	2.27
Professional service	.09	.46	1.14	1.32	1.03	.66	.11	.47	1.08	1.20	1.11	.76
Domestic and personal service	.40	.39	.54	1.14	1.95	2.45	.76	.61	.63	1.02	1.64	2.15
Clerical occupations	1.13	1.65	1.52	.85	.25	.09	.85	1.43	1.48	.96	.36	.12
	Southern						Southern					
Agriculture, forestry, animal husbandry	1.85	0.88	0.70	0.80	1.05	1.28	2.47	1.08	0.69	0.70	1.11	1.64
Extraction of minerals	.86	1.11	1.05	1.13	.76	.60	1.81	1.34	.75	1.03	.72	.21
Manufacturing and mechanical industries	1.03	1.29	.99	1.01	.88	.59	1.20	1.44	1.04	.96	.82	.59
Transportation and communication	1.11	2.43	1.70	.71	.24	.12	.57	1.84	1.60	.95	.45	.21
Trade	.65	1.22	1.15	1.14	.81	.42	.51	1.07	.97	1.11	1.08	.61
Public service (n. e. c.)[1]	.08	.42	.83	1.40	1.38	.81	.06	.10	.54	1.34	1.61	1.03
Professional service	.12	1.09	1.83	1.13	.62	.34	.05	.65	1.61	1.15	.72	.45
Domestic and personal service	.42	.72	.83	1.18	1.37	1.41	.52	.78	.81	1.12	1.25	1.22
Clerical occupations	.47	1.62	1.79	1.04	.32	.14	.25	1.24	1.61	1.14	.44	.14

	North Central						North Central					
Agriculture, forestry, animal husbandry	0.85	0.36	0.80	0.64	2.76	6.34	1.28	0.38	0.24	0.53	2.56	6.91
Extraction of minerals	2.00	1.33	.92	.84	.74	.98	2.08	1.77	1.34	.69	.67	.48
Manufacturing and mechanical industries	1.61	1.10	.83	.97	.97	.69	1.56	1.26	.93	.96	.93	.84
Transportation and communication	1.72	1.77	1.36	.76	.25	.12	1.11	1.62	1.37	.93	.43	.21
Trade	1.19	1.01	.92	1.10	.84	.40	1.11	1.00	.82	1.07	1.10	.58
Public service ((n. e. c.)[1]	.04	.24	.62	1.42	1.57	.85	.04	.04	.42	1.21	2.01	1.22
Professional service	.15	.79	1.36	1.16	.73	.41	.12	.59	1.25	1.13	.84	.58
Domestic and personal service	.78	.64	.63	1.05	1.69	1.89	1.27	.81	.66	.97	1.48	1.68
Clerical occupations	1.12	1.51	1.47	.91	.23	.07	.79	1.38	1.47	1.01	.35	.09
	Western						Western					
Agriculture, forestry, animal husbandry	1.48	0.38	0.32	0.76	2.04	4.18	3.30	0.57	0.31	0.63	1.82	4.30
Extraction of minerals	.83	.64	.81	1.07	1.15	1.48	1.71	1.30	.54	.82	1.45	2.18
Manufacturing and mechanical industries	1.51	.94	[illegible]	.99	1.28	1.04	1.28	1.10	.77	.95	1.22	1.21
Transportation and communication	1.93	2.50	1.77	.71	.17	.08	.71	1.70	1.61	1.03	.36	.22
Trade	1.30	1.21	.95	1.05	.82	.54	.98	1.04	.83	1.03	1.10	.75
Public service (n. e. c.)[1]	.01	.20	.54	1.27	1.43	.78	.34	.07	.38	1.15	1.52	1.19
Professional service	.21	.61	1.24	1.15	.81	.56	.23	.57	1.13	1.12	.89	.69
Domestic and personal service	.95	.67	.59	.99	1.51	1.66	1.47	.91	.68	.91	1.37	1.59
Clerical occupations	1.07	1.66	1.67	.95	.25	.10	.61	1.45	1.59	1.08	.36	.10

[1] N. e. c.=not elsewhere classified.

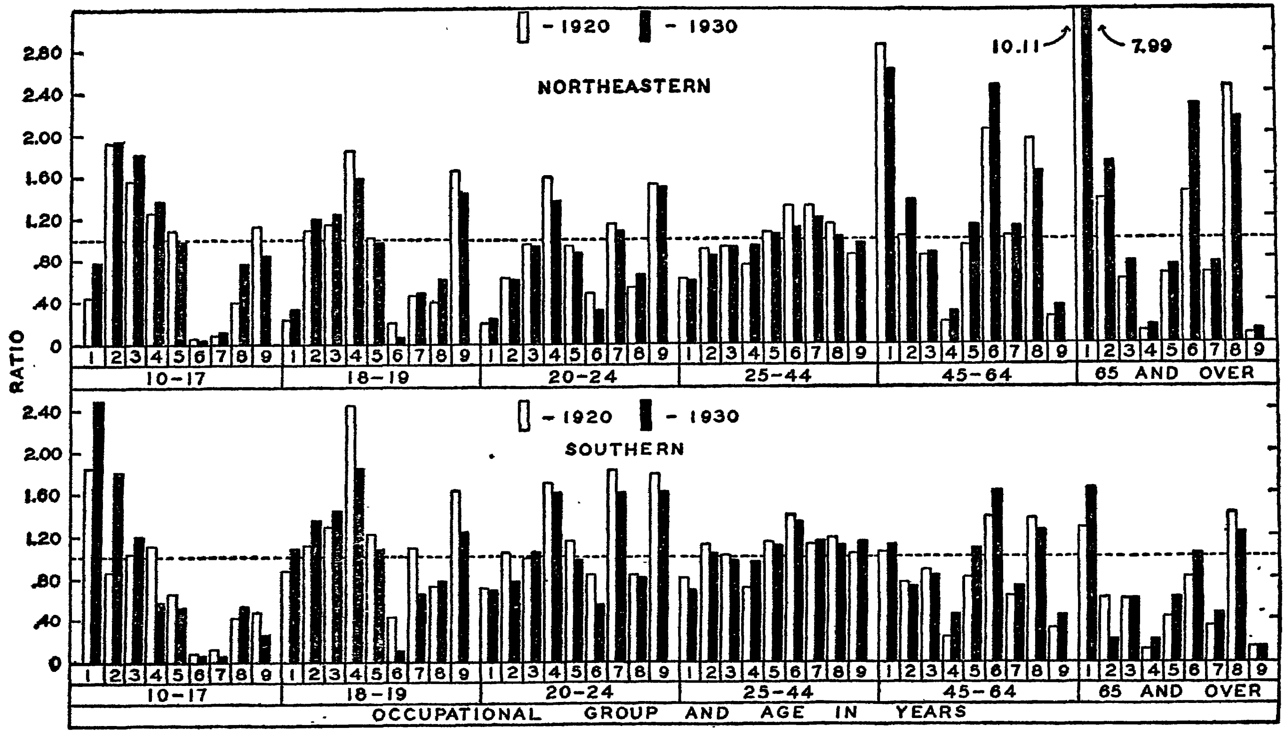

FIGURE 1.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

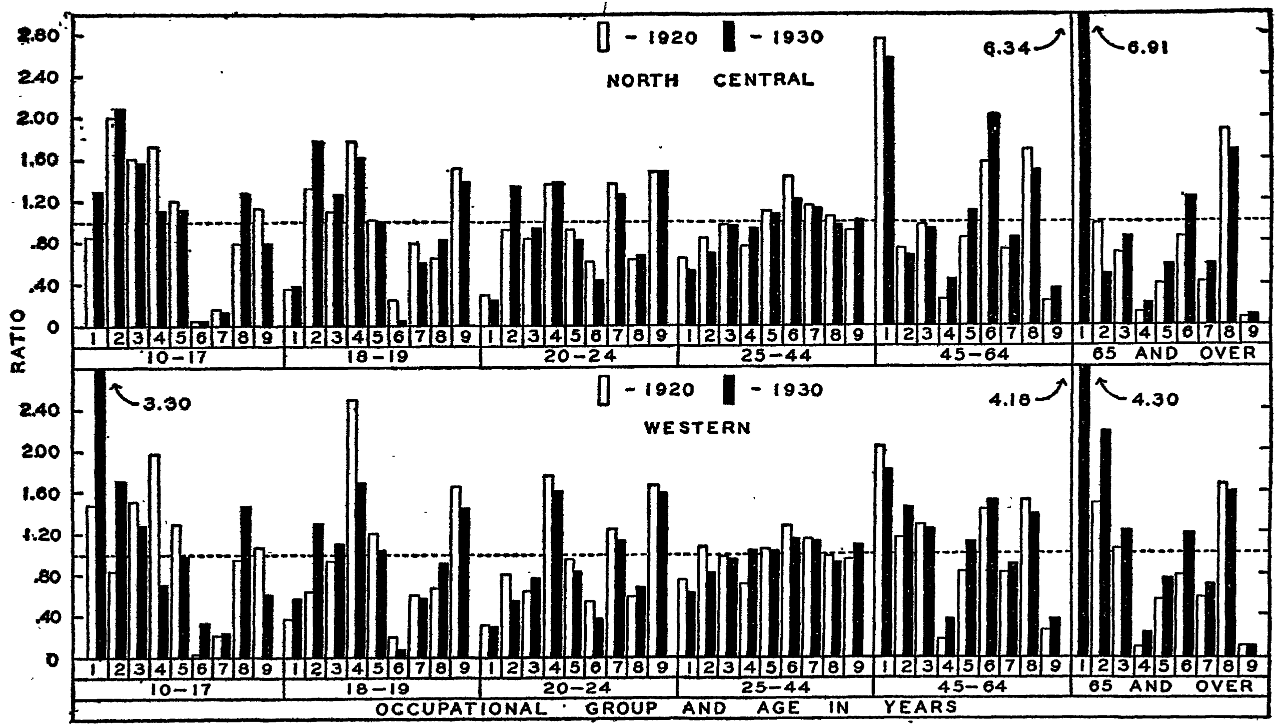

FIGURE 2.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

percentage of persons for the age group and group of occupations represented by the bar is less (or greater) than the percentage expected.

An examination of the matter of normality will throw light on the important question of whether there is, with respect to occupational group, a dearth of workers in the middle-aged and old-aged groups, and an excess in the child group, and how the regions and census years compare in these respects.

Variability of the ratios in the different age groups.—An inspection of figures 1 and 2 discloses an extraordinary lack of stability among the ratios in the different age groups when compared with the male data presented in the previous paper, the phenomenon varying from region to region and from census year to census year. Of interest is the order of the different age groups, specific for region and census year, in this regard. A study of table 3, together with the use of graphs [3] showing, specific for region and census year, the fluctuations of the ratios with age, reveals the age group 25–44 to be least variable; the range of variability for 1920, regardless of region, was from 0.6 to 1.4, and for 1930, from 0.5 to 1.6, the regional differences being slight. In each region and in both years the age group 20–24 followed 25–44. The Northeastern and North Central regions are the only regions showing the same order; in both years this order was 25–44, 20–24, 18–19, 10–17, 45–64, and 65 and over. With the exception of the Southern, the regions showed the age group 65 and over to have the greatest variability and in both years, the great variability being effected by the contribution of agriculture, forestry, and animal husbandry; in the Southern region the greatest variability was shown by the age group 18–19 in 1920 and by the age group 10–17 a decade later. In no region as in the instance of the males is it possible to order the age-distributed occupational groups with respect to the magnitude of the ratios.

Age changes in the ratios; specific occupational groups of different regions compared.—Figure 3 shows graphically how the age changes in the ratios for each of three occupational groups compare with respect to region; figure 4 shows the same for the six remaining groups. In both figures the points corresponding to successive ratios have been joined to facilitate reading. The figures reveal that, first, the ratios of no occupational group lie consistently above or below the expected or normal level of workers; second, the regional ratios for a specific occupational group are in many instances similar for specific age groups; third, the trends of the ratios for 1930 are similar to the trends of the corresponding ratios of a decade earlier, with the exception of extraction of minerals (Southern and Western regions); and, finally, the regions cannot be ordered with respect to the ratios of any occupational group. The trends of the regional ratios will be examined

[3] The graphs are omitted.

subsequently; attention will be directed to exceptional deviations from a trend laid down for a specific occupational group, and to any striking regional differences in specific occupational and age groups.

A particular regional-specific occupational group may be generally assigned to any one of four categories depending upon the movement of the trend of the group with age. These categories are based upon the early, intermediate, or late appearance on the age scale of excesses and dearths of workers. Thus, (1) an excess may be early and late with a dearth intervening, (2) a dearth may be early and late with an excess intervening, (3) a dearth may gradually become an excess, or (4) an excess may gradually become a dearth. The curve associated with the first category is U-shaped; with the second, inverted U-shaped with the third, a line with an ascending slope; and with the fourth, a line with a descending slope. A particular occupational group may be assigned to a specific category when each of its four regional curves is assignable to that category. A study of figures 3 and 4, however, discloses that the majority of the occupational groups behave differently in the different regions and, hence, when the geographic location of the worker is disregarded, these particular groups fail to lend themselves to the simple process of classification as described. This condition contrasts remarkably with that of the males whose occupational groups were more amenable to the indicated process of classification.[4]

With the exception of the Northeastern region in 1920 and in 1930, and the North Central in 1920, agriculture, forestry, and animal husbandry may be assigned to the U-shaped category as in the instance of the males. The striking feature of this set of curves is, in general, the unusually large excess of workers in the older age groups.

Extraction of minerals, engaging a relatively small number of females, is represented by a set of curves very unlike the corresponding ones for the males. Both years are heterogeneous, 1930 showing more regularity. Thus in 1930 the Northeastern and Western regions are definitely U-shaped, while the North Central and Southern regions show declining trends.

The manufacturing and mechanical industries, with the exception of the Western region, shows a declining trend in both years. The Western region may be represented by a U-shaped curve with excesses in the child and older age groups and dearths intervening.

Transportation and communication for both years shows excessive numbers in the early ages, particularly in the age group 18 to 19, the excesses gradually becoming more and more subnormal. In general this occupational group may be assigned to the category represented by a line with a declining slope. The exceptions occur in 1930, when the Southern and Western regions disclose a subnormal number of children.

[4] See introduction to this paper.

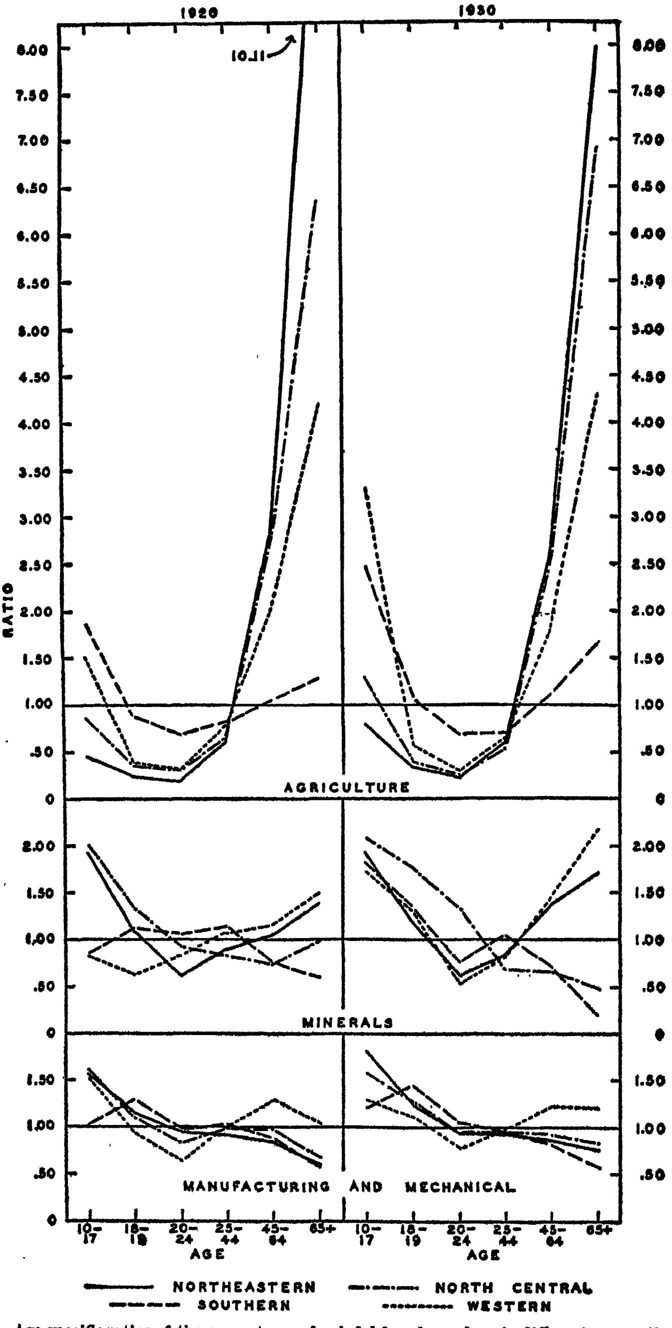

FIGURE 3.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (*Agriculture, forestry and animal husbandry* is abbreviated *agriculture*, while *extraction of minerals* reads *minerals*. Points representing ratios specific for region are joined by straight lines to facilitate reading.)

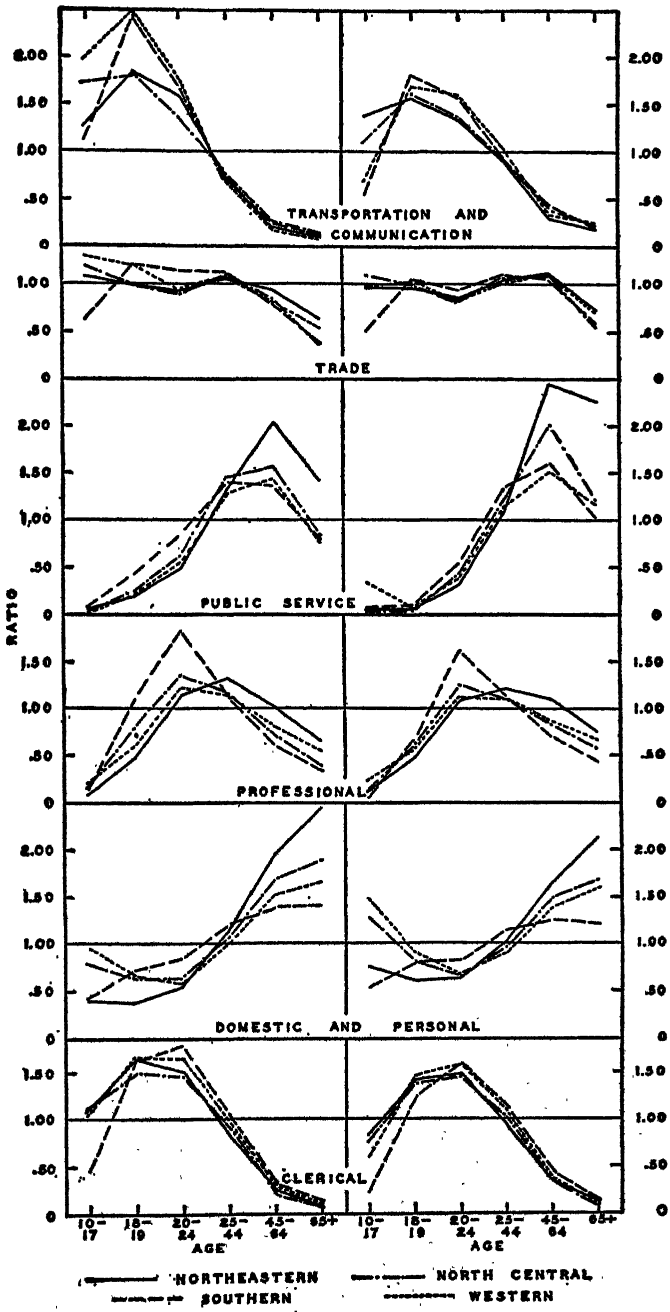

FIGURE 4.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (Points representing ratios specific for region are joined to facilitate reading.)

Trade generally shows a declining trend in both years, with the exception of the Southern region, which shows a subnormal number of children and a dearth in the older ages.

Public service behaves similarly in both years. There is a gradual increase in both years from subnormality in the early-age groups to a maximum excess in the middle-aged group. A definite decline follows, which, in 1920, Northeastern region excepted, is sufficiently great to produce a sensible dearth in the old-aged group.

The professional service group is definitely inverted U-shaped in both years with dearths in the early and late ages and excesses intervening. The dearths in the older ages are striking when compared with the excesses shown by the corresponding ratios of the males.

Domestic and personal service shows, in general, increases in both years from subnormality in the early age groups to excesses in the older groups. The Western and North Central regions in 1930 are the exceptions in that excesses are shown in the child group.

Clerical occupations in 1930 behave similarly, with a subnormal number of children, dearths in the older age groups, and excesses intervening. Ten years previously all of the regions with the exception of the Southern showed excesses in the child group.

The regional comparisons of specific occupational groups set down immediately above contain a sufficient number of exceptions to generalizations to justify a further examination of figures 3 and 4 with respect particularly to excesses in the child group (10–17), and dearths in the middle-aged (45–64) and old-aged (65 and over) groups, respectively. The matter is clarified with the aid of a tabulation such as that shown in table 4 which considers only the direction of the deviations from normal and not the magnitude of such deviations.

An examination of the table as a whole shows that the 18 excesses associated with the child group in 1920 became 16 in 1930; that the 20 subnormal ratios of the middle-aged group became 16, and that the 24 subnormal ratios of the old-aged group became 21.

With respect to the child group the table shows in all regions that the manufacturing and mechanical industries had excesses in 1920 as well as in 1930, transportation and communication had excesses in 1920 that vanished 10 years later in two of the regions, namely, the Southern and the Western, and extraction of minerals had excesses in 1930. A reader interested in the abolishment of child labor would observe, first, that the clerical occupations fared best with the passage of 10 years, all excesses of the different regions in 1920 becoming dearths in 1930; and, second, that the region that fared best was the Northeastern, two of its five excesses becoming dearths (trade and clerical occupations). On the other hand, the five excesses of the North Central region in 1920 became six in 1930.

TABLE 4.—*Excesses and dearths of female workers in 3 important age groups, by geographic region and occupational group, 1920 and 1930 (from figs. 3 and 4)*[1]

Occupational group	Age group, 1920												Age group, 1930										
	10-17				45-64				65 and over				10-17				45-64				65 and over		
	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central
Agriculture, forestry, animal husbandry	−	+	−	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	+	+	+	+
Extraction of minerals	+	−	+	−	+	−	−	+	+	−	−	+	+	+	+	+	+	−	−	+	+	−	−
Manufacturing and mechanical industries	+	+	+	+	−	−	−	+	−	−	−	+	+	+	+	+	−	−	−	+	−	−	−
Transportation and communication	+	+	+	+	−	−	−	−	−	−	−	−	+	−	+	−	−	−	−	−	−	−	−
Trade	+	−	+	+	−	−	−	−	−	−	−	−	−	−	+	−	+	+	+	+	−	−	−
Public service (n. e. c.)[2]	−	−	−	−	+	+	+	+	+	−	−	−	−	−	−	−	+	+	+	+	+	+	+
Professional service	−	−	−	−	+	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−	−	−
Domestic and personal service	−	−	−	−	+	+	+	+	+	+	+	+	−	−	+	+	+	+	+	+	+	+	+
Clerical occupations	+	−	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

[1] +=excess; −=dearth.
[2] N. e. c.=not elsewhere classified.

With respect to the middle-aged group all regions showed a dearth of workers in both years in transportation and communication, and the clerical occupations, and in 1920 only in the occupations connected with trade; in 1930 trade showed excesses in all regions. The passage of 10 years effected a decrease of one in the number of subnormal ratios associated with each region.

With respect to the old-aged group the situation in 1930 appears to be very little different from that indicated in 1920, the only difference being that connected with public service: In 1920 all of the regions with the exception of the Northeastern showed dearths of workers in public service; 10 years later all regions showed excesses in this occupational group. The old-aged group shows more occupational groups that are consistently subnormal in the different regions than the middle-aged group. In 1930 the ratio of such occupational groups among the old-aged to those among the middle-aged was 4 to 2; in 1920, 4 to 3. The four occupational groups showing a subnormal number of workers in the old-aged group were the same in both years for that age group, and are transportation and communication, trade, professional service, and clerical occupations.

SUMMARY

This paper, the third of a series, investigates the age of gainful female workers in different geographic regions of the United States for the census years 1920 and 1930. The regions include a Northeastern, a Southern, a North Central, and a Western. The percentage age distribution for each occupational group for a particular region and census year is compared with the percentage age distribution of all

gainful female workers specific for region and year by forming the ratio of corresponding percentages. The paper may be briefly summarized as follows:

1. Regional differences with respect to the number of workers in specific occupational groups were found only in certain of the age groups. An ordering of the regions with respect to any specific occupational group is, therefore, not possible.

2. The trends of the ratios for 1920 are, with some exceptions, similar to those for 1930.

3. As indicated in the previous paper dealing with males and in the introduction to the present paper, the nine occupational groups, generally regardless of region, were classifiable into four categories, depending upon the particular age groups associated with excesses or dearths of workers. Interregional and intercensal dissimilarities in the present instance preclude such classification. The trend of the ratios of the professional service group, however, describes an inverted U in both years, with dearths in the early and late ages and excesses intervening, the dearths in the older ages being particularly noteworthy when compared with the previously reported excesses shown by the corresponding ratios for the males.

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(*1*) Gafafer, W. M.: (1937) Age of gainful workers of the United States, 1920 and 1930. Studies on the age of gainful workers no. 1. Pub. Health Rep., 52: 269–281.

(*2*) ————: (1937) Age of gainful male workers in different geographic regions of the United States, 1920 and 1930. Studies on the age of gainful workers no. 2. Ibid., 52: 437–453.

(*3*) U. S. Department of Commerce, Bureau of the Census: (1933) Fifteenth Census of the United States, 1930. Population, v. 5, General Report on Occupations. Government Printing Office, Washington, D. C. P. 114.

PLAGUE INFECTION FOUND IN FLEAS AND LICE TAKEN FROM GROUND SQUIRRELS IN WASHINGTON STATE

According to a report dated May 15, 1937, from Senior Surgeon C. R. Eskey, plague infection has been proved, by animal inoculation and cultural reactions, in fleas and lice taken from ground squirrels in Washington as follows:

An inoculation of 33 fleas and 3 lice collected by the Washington field unit, April 29, 1937, from 21 *Citellus townsendi* shot on secs. 5 and 33, Tps. 17 and 18 N., R. 34 E., in Adams County, Wash.

An inoculation of 18 fleas and 5 lice obtained by the Washington field unit, April 29, 1937, from 13 *Citellus townsendi* on secs. 8 and 9, T. 17 N., R. 34 E., Adams County, Wash.

It is believed that this is the first positive evidence that plague exists among wild rodents in the State of Washington, and that the

locality in which the infected fleas and lice were collected is the most northern point in the United States in which wild-rodent plague has been found.

DEATHS DURING WEEK ENDED MAY 15, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 15, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	8,441	8,511
Average for 3 prior years	8,711	
Total deaths, first 19 weeks of year	186,226	182,654
Deaths under 1 year of age	491	586
Average for 3 prior years	613	
Deaths under 1 year of age, first 19 weeks of year	11,439	11,211
Data from industrial insurance companies:		
Policies in force	69,645,048	68,269,107
Number of death claims	13,447	13,218
Death claims per 1,000 policies in force, annual rate	10.1	10.1
Death claims per 1,000 policies, first 19 weeks of year, annual rate	11.2	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 22, 1937, and May 23, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
New England States:								
Maine		4		6	21	352	0	0
New Hampshire					34	69	0	0
Vermont	1				1	354	0	0
Massachusetts	6	6			716	1,448	9	4
Rhode Island	1	2			150	70	1	1
Connecticut	2	8	3		189	219	0	3
Middle Atlantic States:								
New York	28	35	[1] 7	[1] 1	1,693	3,212	10	19
New Jersey	16	5	7	3	1,800	588	0	4
Pennsylvania	22	42			1,728	1,257	8	15
East North Central States:								
Ohio	12	9	24	19	586	435	6	9
Indiana	10	13	12	29	653	10	2	5
Illinois	37	35	38	62	346	20	4	9
Michigan	18	9		2	168	104	0	5
Wisconsin	1	8	57	34	63	222	1	0
West North Central States:								
Minnesota	2	1	1	2	13	412	2	2
Iowa	6	2		1	3	8	0	1
Missouri	10	16	36	50	48	20	1	2
North Dakota			3		2	2	2	0
South Dakota [2]		1			5		0	0
Nebraska			1		10	22	3	0
Kansas	7	2	2	4	22	10	1	1
South Atlantic States:								
Delwawre					24	11	0	0
Maryland [3]	6		2	5	408	216	1	7
District of Columbia	29	19		1	107	161	2	4
Virginia	6	10		83	502	111	5	9
West Virginia	4	5	20	30	78	93	4	6
North Carolina	16	9	3	4	272	19	2	6
South Carolina	1	3	69	104		62	0	1
Georgia [4]	3	6				8	1	3
Florida	5	4	3	4		19	1	0
East South Central States:								
Kentucky	7	9	8	30	292	37	11	13
Tennessee	4	7	42	74	138	35	2	4
Alabama [4]	5	11	49	14	28	5	3	1
Mississippi [3]	1	4					1	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 22, 1937, and May 23, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
West South Central States:								
Arkansas	2	8	26	48	2	9	0	0
Louisiana	10	12	6	44	7	72	1	1
Oklahoma	5	4	34	71	86	21	1	1
Texas [4]	46	26	298	138	1,003	216	5	3
Mountain States:								
Montana [2]		2	21	14	29	4	0	0
Idaho [2]	2		15		25	16	0	1
Wyoming [2 5]		1			5	2	0	0
Colorado [2]	8	7			20	36	0	0
New Mexico		6	1	2	82	43	0	2
Arizona			25	30	46	137	1	1
Utah [3]				5	52	24	0	0
Pacific States:								
Washington	1	3			55	437	1	0
Oregon [2]	8	2	17	18	16	238	1	0
California	32	27	41	147	281	2,096	4	6
Total	370	373	871	1,024	11,809	12,971	102	151
First 20 weeks of year	9,628	10,639	269,849	133,966	164,931	203,937	3,213	4,742

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
New England States:								
Maine	0	0	21	8	0	0	1	0
New Hampshire	0	0	11	10	0	0	0	0
Vermont	1	0	13	1	0	0	0	0
Massachusetts	0	5	259	202	0	0	0	1
Rhode Island	0	1	58	26	0	0	1	0
Connecticut	0	0	149	34	0	0	0	0
Middle Atlantic States:								
New York	1	0	774	703	0	0	8	5
New Jersey	1	0	181	284	0	0	1	2
Pennsylvania	1	3	413	573	0	0	5	10
East North Central States:								
Ohio	0	0	209	171	0	0	5	14
Indiana	1	0	115	123	19	1	1	1
Illinois	1	1	570	512	16	20	5	4
Michigan	2	4	790	259	9	0	5	5
Wisconsin	0	0	309	416	2	6	0	2
West North Central States:								
Minnesota	0	0	137	244	17	10	0	1
Iowa	0	0	156	136	20	33	0	7
Missouri	0	0	155	194	61	4	3	1
North Dakota	0	0	23	130	7	6	1	1
South Dakota [2]	0	0	59	71	4	21	0	0
Nebraska	0	0	57	77	4	14	0	0
Kansas	0	0	210	267	4	38	3	0
South Atlantic States:								
Delaware	0	0	3	9	0	0	1	0
Maryland [3]	0	0	41	50	0	0	2	2
District of Columbia	0	0	14	17	0	0	2	0
Virginia	1	0	10	37	0	0	7	4
West Virginia	0	0	73	28	2	0	3	9
North Carolina	0	1	38	12	0	0	3	4
South Carolina	0	0	1	2	0	0	3	1
Georgia [4]	0	0	14	8	0	0	5	7
Florida	0	0	4	4	0	0	7	5
East South Central States:								
Kentucky	0	1	51	22	1	0	5	5
Tennessee	1	2	11	13	0	0	7	4
Alabama [4]	0	0	5	3	0	0	6	0
Mississippi [3]	2	0	4	4	0	0	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 22, 1937, and May 23, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
West South Central States:								
Arkansas	6	0	11	5	1	0	1	3
Louisiana	1	0	11	4	0	0	19	13
Oklahoma	0	0	29	34	4	2	4	6
Texas [4]	2	0	225	49	16	1	16	7
Mountain States:								
Montana [2]	0	0	17	56	19	12	0	0
Idaho [2]	0	0	21	16	5	6	3	1
Wyoming [2, 5]	0	0	5	25	2	10	0	0
Colorado [2]	0	0	30	83	2	1	0	4
New Mexico	0	0	16	75	0	0	0	7
Arizona	0	0	10	11	0	0	5	2
Utah [3]	0	0	16	55	0	3	1	0
Pacific States:								
Washington	0	0	42	91	7	3	1	4
Oregon [2]	1	0	35	18	7	20	2	0
California	2	4	210	266	23	4	2	13
Total	18	22	5,616	5,438	252	215	146	156
First 20 weeks of year [6]	433	335	134,892	149,796	6,239	4,494	2,265	2,268

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended May 22, 1937, 15 cases, as follows: South Dakota, 1; Montana, 1; Idaho, 1; Wyoming, 2; Colorado, 3; Oregon, 7.
[3] Week ended earlier than Saturday.
[4] Typhus fever, week ended May 22, 1937, 23 cases, as follows: Georgia, 8; Alabama, 6; Texas, 9.
[5] Colorado tick fever, week ended May 22, 1937, Wyoming, 2 cases.
[6] The total for scarlet fever for the first 18 weeks of 1937 (Public Health Reports for May 21, 1937, p. 676) should have been 123,493 instead of 23,493, and for the first 19 weeks (Public Health Reports for May 28, p. 701), 129,276 instead of 29,276.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1937										
Alabama	60	34	1,838	102	64	10	2	41	1	6
Georgia	9	30	1,231	476	15	40	1	41	0	13
Idaho	6	5	58	----	132	----	1	86	14	2
Illinois	24	150	274	10	765	----	3	3,371	203	10
Kansas	4	15	44	2	162	----	1	1,428	90	5
Maine	1	8	15	----	51	----	1	88	0	8
Maryland	17	42	46	1	2,947	1	0	211	0	6
Michigan	8	61	12	4	524	----	5	3,279	64	12
Minnesota	2	49	3	----	127	----	2	751	57	1
Mississippi	4	20	5,648	2,659	1,744	314	4	28	1	7
Nevada	----	----	7	----	31	----	0	46	0	0
New York	45	160	----	4	4,800	----	2	4,268	1	24
Oklahoma [1]	18	33	427	26	304	12	6	131	11	16
Rhode Island	3	----	----	----	997	----	0	249	0	5
South Dakota	1	3	4	1	14	----	0	414	18	2
Washington	7	4	26	----	211	----	2	128	41	4

[1] Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

April 1937	Cases
Actinomycosis:	
Illinois	2
Botulism:	
Kansas	1
Chicken pox:	
Alabama	108
Georgia	246
Idaho	113
Illinois	1,965
Kansas	413
Maine	244
Maryland	718
Michigan	1,866
Minnesota	626
Mississippi	794
Nevada	5
New York	4,129
Oklahoma [1]	55
Rhode Island	153
South Dakota	26
Washington	861
Conjunctivitis:	
Georgia	3
Idaho	6
Illinois	2
Oklahoma [1]	1
Dengue:	
Alabama	1
Mississippi	5
Diarrhea:	
Maryland	3
Dysentery:	
Alabama (amoebic)	3
Georgia (amoebic)	20
Georgia (bacillary)	21
Illinois (amoebic)	3
Illinois (amoebic carriers)	13
Illinois (bacillary)	32
Maryland (bacillary)	4
Michigan (amoebic)	3
Minnesota (amoebic)	3
Minnesota (bacillary)	1
Mississippi (amoebic)	76
Mississippi (bacillary)	399
New York (amoebic)	3
New York (bacillary)	42
Oklahoma (amoebic) [1]	5
Oklahoma (unspecified) [1]	1
Washington (amoebic)	1
Encephalitis, epidemic or lethargic:	
Alabama	3
Idaho	1
Illinois	7
Kansas	2
Maryland	1
New York	17
Oklahoma [1]	1
Washington	3
German measles:	
Alabama	3
Idaho	2
Illinois	72
Kansas	12
Maine	39
Maryland	70
Michigan	1,174
New York	269

April 1937—Continued	Cases
German measles—Cont.	
Rhode Island	31
Washington	16
Hookworm disease:	
Georgia	1,082
Mississippi	332
Impetigo contagiosa:	
Kansas	1
Maryland	6
Oklahoma [1]	1
Jaundice, acute infectious:	
Michigan	2
Mumps:	
Alabama	284
Georgia	321
Idaho	93
Illinois	1,089
Kansas	1,124
Maine	286
Maryland	1,084
Michigan	2,436
Mississippi	1,272
Oklahoma [1]	22
Rhode Island	25
South Dakota	7
Washington	618
Ophthalmia neonatorum:	
Alabama	1
Illinois	2
Mississippi	3
New York [2]	13
Paratyphoid fever:	
Georgia	2
Illinois	2
Michigan	3
Minnesota	1
New York	1
Washington	1
Puerperal septicemia:	
Mississippi	26
Rabies in animals:	
Alabama	98
Illinois	49
Maine	3
Michigan	8
Mississippi	19
New York [2]	5
Washington	26
Rocky Mountain spotted fever:	
Idaho	4
Scabies:	
Kansas	1
Maryland	1
Oklahoma [1]	5
Septic sore throat:	
Georgia	39
Idaho	2
Illinois	7
Kansas	5
Maine	1
Maryland	25
Michigan	36
Minnesota	12
New York	125
Oklahoma [1]	25
Rhode Island	4
South Dakota	8
Washington	1

April 1937—Continued	Cases
Tetanus:	
Alabama	5
Illinois	2
Kansas	1
Maryland	2
Michigan	1
New York	8
Trachoma:	
Idaho	1
Illinois	153
Kansas	2
Maryland	1
Minnesota	3
Mississippi	23
Oklahoma [1]	1
South Dakota	1
Trichinosis:	
Michigan	13
New York	12
Tularaemia:	
Alabama	1
Georgia	11
Illinois	2
Michigan	1
Typhus fever:	
Alabama	20
Georgia	50
New York	3
Undulant fever:	
Alabama	1
Georgia	7
Illinois	6
Kansas	2
Maine	4
Maryland	1
Michigan	8
Minnesota	9
Mississippi	1
Nevada	4
New York	18
Oklahoma [1]	25
Washington	5
Vincent's infection:	
Idaho	19
Illinois	25
Maine	8
Maryland	15
Michigan	20
New York [2]	63
Oklahoma [1]	4
Washington	4
Whooping cough:	
Alabama	205
Georgia	80
Idaho	63
Illinois	803
Kansas	291
Maine	237
Maryland	476
Michigan	1,223
Minnesota	957
Mississippi	689
Nevada	9
New York	1,705
Oklahoma [1]	37
Rhode Island	167
South Dakota	9
Washington	300

[1] Exclusive of Oklahoma City and Tulsa.
[2] Exclusive of New York City.

PLAGUE INFECTION FOUND IN FLEAS AND LICE IN STATE OF WASHINGTON

For report of plague infection found in fleas and lice taken from ground squirrels in Adams County, Wash., see page 748.

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	793	2.80	104	0.37
Arizona [1]				
Arkansas [2]	521	2.61	291	1.46
California	2,362	4.19	1,931	3.42
Colorado [1]				
Connecticut	239	1.39	98	.57
Delaware	184	7.19	35	1.37
District of Columbia	196	3.30	177	2.98
Florida [2]	63	.39	26	.16
Georgia	1,447	4.33	565	1.69
Idaho	70	1.46	65	1.36
Illinois	2,244	2.87	1,321	1.69
Indiana	157	.46	126	.37
Iowa [2]	262	1.03	197	.78
Kansas	152	.82	36	.19
Kentucky	255	.90	97	.34
Louisiana	210	.99	113	.53
Maine	71	.84	58	.69
Maryland	733	4.39	253	1.52
Massachusetts	637	1.46	462	1.06
Michigan	752	1.61	545	1.17
Minnesota	267	1.02	279	1.06
Mississippi	2,184	11.14	2,354	12.00
Missouri	382	.98	231	.59
Montana [2]	22	.41	23	.43
Nebraska	77	.56	78	.57
Nevada [3]				
New Hampshire	30	.60	19	.38
New Jersey	745	1.74	226	.53
New Mexico	143	3.56	45	1.12
New York	9,255	7.18	2,072	1.61
North Carolina	2,459	7.20	485	1.42
North Dakota	31	.44	44	.63
Ohio	1,242	1.85	330	.49
Oklahoma [2]	264	1.05	262	1.04
Oregon	64	.63	116	1.15
Pennsylvania [4]	1,008	1.00	149	.15
Rhode Island	90	1.32	52	.76
South Carolina [2]	418	2.08	387	1.92
South Dakota	102	1.51	34	.50
Tennessee	682	2.35	242	.83
Texas	310	.51	385	.63
Utah [3]				
Vermont	15	.40	21	.56
Virginia	630	2.40	221	.84
Washington	262	1.60	360	2.20
West Virginia	336	1.85	113	.62
Wisconsin [5]	36	.12	138	.47
Wyoming [3]				
Total	32,402	2.59	15,166	1.21

See footnotes at end of table.

Reports from cities of 200,000 population or over

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Akron, Ohio	56	2.06	14	.52
Atlanta, Ga	171	5.96	165	5.75
Baltimore, Md	368	4.46	144	1.75
Birmingham, Ala	184	6.52	116	4.11
Boston, Mass	257	3.25	168	2.12
Buffalo, N. Y	316	5.34	105	1.77
Chicago, Ill	1,417	3.97	857	2.40
Cincinnati, Ohio [1]				
Cleveland, Ohio	234	2.52	102	1.10
Columbus, Ohio	71	2.32	34	1.11
Dallas, Tex	291	1.00	68	2.35
Dayton, Ohio [1]				
Denver, Colo	105	3.54	53	1.79
Detroit, Mich	394	2.28	237	1.37
Houston, Tex.[6]	138	4.12	33	.99
Indianapolis, Ind	30	.80	38	1.00
Jersey City, N. J.[1]				
Kansas City, Mo	58	1.38	6	.14
Los Angeles, Calif	579	4.04	414	2.89
Louisville, Ky	137	4.23	51	1.57
Memphis, Tenn	275	10.30	72	2.70
Milwaukee, Wis.[1]				
Minneapolis, Minn	85	1.75	92	1.89
Newark, N. J	252	5.44	181	3.91
New Orleans, La				
New York, N. Y	7,616	10.43	1,446	1.98
Oakland, Calif	40	1.32	36	1.19
Omaha, Nebr	13	.59	7	.32
Philadelphia, Pa.[1]				
Pittsburgh, Pa	90	1.32	23	.34
Portland, Oreg.[3]				
Providence, R. I	45	1.74	24	.93
Rochester, N. Y	59	1.75	48	1.42
St. Louis, Mo	181	2.17	139	1.66
St. Paul, Minn	33	1.17	42	1.49
San Antonio, Tex	9	.36	5	.20
San Francisco, Calif	129	1.92	144	2.15
Seattle, Wash	135	3.56	173	4.56
Syracuse, N. Y	101	4.63	50	2.29
Toledo, Ohio	90	2.96	48	1.58
Washington, D. C.[7]	196	3.30	177	2.98

[1] No report for current month.
[2] Incomplete.
[3] Not reporting.
[4] Includes only those cases that enter the clinics conducted by the State department of health.
[5] Only cases of syphilis in the infectious stage are reported.
[6] Reported by the Jefferson Davis Hospital; physicians are not required to report venereal disease.
[7] Reported by the Social-Hygiene clinic.

ANNUAL CASE RATES [1] FOR VENEREAL DISEASES, CALENDAR YEAR 1936

Reports from States

	Annual rates per 1,000 population			Annual rates per 1,000 population	
	Syphilis	Gonorrhea		Syphilis	Gonorrhea
Alabama	3.96	1.36	Nevada [2]		
Arizona	1.12	2.73	New Hampshire	.31	.38
Arkansas	1.18	.68	New Jersey	1.61	.74
California	2.77	2.71	New Mexico	1.85	1.22
Colorado	.37	.41	New York	6.83	1.73
Connecticut	1.46	.89	North Carolina	5.09	1.64
Delaware	5.78	2.08	North Dakota	.31	.95
District of Columbia	3.38	3.34	Ohio	1.26	.54
Florida	2.04	.71	Oklahoma	.92	.74
Georgia	4.19	1.97	Oregon	.74	1.58
Idaho	.61	.59	Pennsylvania	.39	.20
Illinois	2.14	1.66	Rhode Island	1.96	1.07
Indiana	.45	.41	South Carolina	1.38	1.73
Iowa	.51	.70	South Dakota	.25	.50
Kansas	.53	.42	Tennessee	3.15	1.63
Kentucky	.94	1.01	Texas	.93	.38
Louisiana	1.30	.66	Utah [2]		
Maine	.52	.67	Vermont	.20	.92
Maryland	5.76	1.72	Virginia	2.52	1.21
Massachusetts	1.26	1.39	Washington	1.20	1.84
Michigan	1.38	1.40	West Virginia	1.34	.74
Minnesota	1.29	1.32	Wisconsin	.10	.57
Mississippi	8.46	12.30	Wyoming [2]		
Missouri	1.24	.70			
Montana	.92	1.21	Total	2.26	1.31
Nebraska	.29	.61			

Reports from cities of 200,000 population or over

Akron, Ohio	0.93	0.46	Milwaukee, Wis	0.10	0.33
Atlanta, Ga	6.22	6.23	Minneapolis, Minn	1.81	2.52
Baltimore, Md	6.78	1.99	Newark, N. J	5.87	2.70
Birmingham, Ala	5.58	2.87	New Orleans, La	2.01	1.45
Boston, Mass	3.25	3.41	New York, N. Y	9.44	1.98
Buffalo, N. Y	3.89	1.77	Oakland, Calif	1.52	1.60
Chicago, Ill	2.61	2.27	Omaha, Nebr	.56	.67
Cincinnati, Ohio	1.68	1.22	Philadelphia, Pa	1.54	.36
Cleveland, Ohio	2.49	1.15	Pittsburgh, Pa	1.07	.44
Columbus, Ohio	1.83	.81	Portland, Oreg	1.53	2.75
Dallas, Tex	3.60	1.73	Providence, R. I	2.84	1.60
Dayton, Ohio	2.54	1.04	Rochester, N. Y	1.72	1.76
Denver, Colo	1.35	1.20	St. Louis, Mo	3.37	1.79
Detroit, Mich	1.42	1.86	St. Paul, Minn	1.34	1.82
Houston, Tex	7.43	2.19	San Antonio, Tex. [3]		
Indianapolis, Ind	.89	1.16	San Francisco, Calif	2.47	2.52
Jersey City, N. J	.06	.06	Seattle, Wash	3.16	4.53
Kansas City, Mo	1.60	.20	Syracuse, N. Y	4.79	2.37
Los Angeles, Calif	3.42	2.98	Toledo, Ohio	1.85	1.15
Louisville, Ky	9.64	4.91	Washington, D. C	3.38	3.34
Memphis, Tenn	8.54	2.88			

[1] Based on monthly reports.
[2] Not reporting.
[3] Reported for only 1 month.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 15, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	200	154	50	7,328	673	2,357	19	432	31	1,472	--------
Current week	153	68	37	4,592	611	2,537	26	392	24	1,398	--------
Maine:											
Portland	0	------	0	0	2	1	0	0	0	5	26
New Hampshire:											
Concord	0	------	0	1	1	0	0	0	0	0	17
Nashua	0	------	0	0	1	0	0	0	0	0	9
Vermont:											
Barre	1	------	0	0	0	2	0	0	0	2	1
Burlington	0	------	0	0	0	0	0	0	0	0	7
Rutland	0	------	0	1	2	0	0	1	0	2	8
Massachusetts:											
Boston	0	------	0	44	24	59	0	11	0	45	235
Fall River	0	------	0	57	1	4	0	0	0	3	26
Springfield	0	------	0	0	4	10	0	1	0	7	37
Worcester	0	------	0	25	6	5	0	0	0	20	50
Rhode Island:											
Pawtucket	0	------	0	5	0	1	0	0	0	0	10
Providence	0	------	0	154	7	32	0	1	0	7	57
Connecticut:											
Bridgeport	0	------	0	1	3	79	0	0	0	0	29
Hartford	1	------	0	16	2	3	0	0	0	2	41
New Haven	0	------	0	8	1	10	0	0	0	1	42
New York:											
Buffalo	0	------	1	99	20	24	0	7	0	82	166
New York	37	7	4	952	110	418	0	89	3	61	1,488
Rochester	0	1	0	12	2	3	0	1	0	7	48
Syracuse	0	------	0	40	6	22	0	0	0	22	41
New Jersey:											
Camden	2	------	0	2	1	4	0	0	0	5	33
Newark	0	1	0	166	11	17	0	5	0	15	113
Trenton	0	------	0	3	2	9	0	1	0	6	38
Pennsylvania:											
Philadelphia	5	6	4	31	34	292	0	31	1	51	514
Pittsburgh	0	2	2	160	19	59	0	8	0	23	193
Reading	1	------	1	403	2	14	0	1	0	4	28
Scranton	0	------	--------	0	-------	19	0	-------	0	2	--------
Ohio:											
Cincinnati	1	2	1	206	9	19	0	8	0	17	130
Cleveland	1	8	2	393	21	135	0	7	0	42	189
Columbus	1	------	0	24	2	14	0	4	1	33	76
Toledo	0	------	0	360	3	4	0	4	0	47	77
Indiana:											
Anderson	0	------	0	10	0	10	0	0	0	3	7
Fort Wayne	0	------	0	1	1	4	0	2	0	6	23
Indianapolis	6	------	0	477	9	36	0	3	1	63	115
Muncie	0	------	0	0	1	0	0	1	0	4	20
South Bend	0	------	0	4	0	4	0	0	0	8	17
Terre Haute	1	------	0	0	0	0	4	0	0	1	21
Illinois:											
Alton	0	------	0	0	1	6	0	0	0	1	14
Chicago	21	3	1	104	30	283	0	47	0	74	665
Elgin	0	------	0	0	1	0	0	0	0	4	9
Moline	0	------	0	0	2	7	0	0	0	2	11
Springfield	0	------	0	3	0	7	0	0	0	7	17
Michigan:											
Detroit	5	------	2	27	21	352	4	16	2	42	295
Flint	0	------	0	55	6	20	0	1	0	3	35
Grand Rapids	0	------	0	74	2	17	0	1	0	31	35
Wisconsin:											
Kenosha	0	------	0	1	0	5	0	0	0	2	10
Madison	0	------	0	0	0	3	0	0	0	4	16
Milwaukee	1	2	2	10	9	65	0	8	0	16	128
Racine	0	------	0	1	1	9	0	0	0	1	16
Superior	0	------	0	0	0	9	0	0	0	0	8
Minnesota:											
Duluth	0	------	0	0	0	27	0	2	0	7	32
Minneapolis	2	------	1	2	3	21	0	1	0	34	98
St. Paul	0	1	1	1	8	14	0	1	0	79	56

City reports for week ended May 15, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Cedar Rapids	0			2		5	0		0	0	
Davenport	0			0		5	1		0	1	
Des Moines	0			0		27	1		0	0	27
Sioux City	0			0		9	0		0	2	
Waterloo	2			0		15	0		0	2	
Missouri:											
Kansas City	2		0	2	9	75	0	4	0	12	85
St. Joseph	0		0	0	3	4	3	0	0	1	12
St. Louis	14		1	19	1	169	0	5	1	84	205
North Dakota:											
Fargo	0			1		0	0		0	2	
Grand Forks	0			0		0	1		0	0	
Minot	0			0		0	0		0	0	3
South Dakota:											
Aberdeen	0			0		3	0		0	0	
Sioux Falls	0		0	0	0	0	0	0	0	0	5
Nebraska:											
Omaha	0		1	0	3	4	1	0	0	9	40
Kansas:											
Lawrence	0		0	0	1	1	0	0	0	0	8
Topeka	1		1	0	2	7	1	0	0	7	28
Wichita	0		0	15	5	4	0	0	0	15	24
Delaware:											
Wilmington	0		0	3	5	1	0	1	0	2	33
Maryland:											
Baltimore	2	2	2	290	18	13	0	12	0	73	212
Cumberland	0		0	0	3	0	0	1	0	2	14
Frederick	0		0	0	0	0	0	0	0	0	7
Dist. of Col.:											
Washington	3		0	104	14	10	0	10	0	11	157
Virginia:											
Lynchburg	0		0	3	1	0	0	2	0	6	19
Richmond	0		1	1	4	2	0	1	0	3	45
Roanoke	0		0	121	0	1	0	0	0	2	15
West Virginia:											
Charleston	0	1	0	0	4	2	0	0	0	0	23
Huntington	0			0		11	0		0	0	
Wheeling	0		0	0	1	4	0	1	0	10	21
North Carolina:											
Gastonia	1	0	0	1	0	0	0	0	0	0	
Raleigh	0		0	1	1	0	0	1	0	0	8
Wilmington	0		0	0	1	0	0	3	0	3	12
Winston-Salem	0		0	0	0	2	0	2	0	1	11
South Carolina:											
Charleston	0	5	0	0	4	0	0	1	1	2	17
Columbia	0		0	0	3	0	0	1	0	0	24
Florence	0		0	0	3	0	0	0	0	0	10
Greenville	0		0	1	1	0	0	1	1	10	9
Georgia:											
Atlanta	0	4	0	0	9	2	0	4	0	10	82
Brunswick	0		0	0	1	0	0	0	0	3	4
Savannah	0	12	0	0	0	1	0	0	0	4	30
Florida:											
Miami	1	7	0	0	2	1	0	4	0	4	24
Tampa	1	1	1	15	3	0	0	1	0	3	21
Kentucky:											
Ashland	0		0	35	3	0	0	0	2	0	7
Covington	0		0	42	1	1	0	0	0	5	15
Lexington	0		0	5	3	0	0	3	0	21	22
Louisville	0	2	0	47	11	14	0	2	0	32	79
Tennessee:											
Knoxville	0	1	1	0	3	0	0	2	0	0	32
Memphis	0		1	79	4	1	0	2	2	45	71
Nashville	0		0	15	4	7	0	5	0	4	46
Alabama:											
Birmingham	3		2	6	10	2	0	6	1	7	76
Mobile	1		0	0	2	4	0	2	0	0	24
Montgomery	0	1		1		0	0		0	0	
Arkansas:											
Fort Smith	0			2		0	0		0	1	
Little Rock	0		0	0	6	4	0	1	0	0	7
Louisiana:											
Lake Charles	1		0	0	2	0	0	0	0	0	9
New Orleans	8	2	0	9	17	16	0	9	2	2	142
Shreveport	2		0	0	12	0	0	2	3	5	44

City reports for week ended May 15, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Muskogee	0			0		1	0		0	0	
Oklahoma City	1	4	0	0	10	8	0	2	0	0	37
Tulsa	0			7		5	0		0	8	
Texas:											
Dallas	1		0	185	5	5	0	1	0	21	64
Fort Worth	0		0	9	0	9	0	2	1	9	35
Galveston	0		0	0	3	0	0	0	0	0	16
Houston	6		1	0	7	1	0	8	0	3	77
San Antonio	1		1	6	9	1	0	5	0	3	82
Montana:											
Billings	0		0	0	0	0	0	0	0	3	11
Great Falls	0		0	0	0	1	0	0	0	3	5
Helena	0		0	0	0	3	0	0	0	0	3
Missoula	0		0	0	1	0	1	0	0	0	9
Idaho:											
Boise	0		0	0	1	1	0	0	0	1	6
Colorado:											
Colorado Springs	0		0	0	0	3	0	2	0	0	14
Denver	4		0	19	7	15	3	6	2	36	99
Pueblo	0		0	1	2	0	0	1	0	3	13
New Mexico:											
Albuquerque	0		0	0	1	5	0	0	0	1	11
Utah:											
Salt Lake City	0		1	31	2	3	0	1	0	23	29
Washington:											
Seattle	1		1	4	6	2	0	4	1	33	98
Spokane	0		0	28	1	4	2	3	0	14	25
Tacoma	0		0	0	0	1	1	1	0	4	31
Oregon:											
Portland	0	1	0	2	8	20	2	1	0	1	74
Salem	0			0		2	0		0	0	
California:											
Los Angeles	15	6	1	36	26	37	6	18	1	88	327
Sacramento	0		0	38	4	4	0	0	1	12	26
San Francisco	2	1	0	3	15	16	0	11	1	39	189

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	3	0	0
Springfield	1	0	0
Rhode Island:			
Providence	2	0	0
New York:			
Buffalo	1	0	0
New York	5	0	0
Pennsylvania:			
Philadelphia	4	2	0
Pittsburgh	0	2	0
Ohio:			
Cincinnati	1	2	0
Cleveland	1	0	0
Indiana:			
Anderson	1	0	0
Indianapolis	2	0	1
Illinois:			
Chicago	1	2	1
Minnesota:			
Minneapolis	2	0	0
Missouri:			
St. Joseph	0	1	0
St. Louis	2	2	0
Maryland:			
Baltimore	1	2	0
District of Columbia:			
Washington	2	0	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Virginia:			
Richmond	1	1	0
West Virginia:			
Huntington	1	0	0
Wheeling	2	1	0
Georgia:			
Atlanta	1	1	0
Florida:			
Miami	0	1	0
Kentucky:			
Louisville	1	0	0
Alabama:			
Birmingham	1	0	0
Louisiana:			
Shreveport	0	0	1
Oklahoma:			
Muskogee	1	0	0
Tulsa	1	0	0
Texas:			
Galveston	1	0	0
Houston	0	1	0
San Antonio	0	0	1
Colorado:			
Denver	1	1	0
Utah:			
Salt Lake City	1	0	0
California:			
Los Angeles	0	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 3; Spokane, 1.

Pellagra.—Cases: Charleston, S. C., 4; Brunswick, 1; Savannah, 10; Miami, 1; Montgomery, 1; Los Angeles, 2.

FOREIGN AND INSULAR

CANADA

Correction.—A report appearing on page 681 of the Public Health Reports for May 21, 1937, shows 39 cases of diphtheria in the Province of New Brunswick during the 2 weeks ended April 24, 1937. This is an error. The report should have read 39 cases of chicken pox, which will make the total for chicken pox 1,132 cases and that for diphtheria 62 cases.

CUBA

Habana—Communicable diseases—4 weeks ended May 8, 1937.—During the 4 weeks ended May 8, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	25	2	Scarlet fever	1	
Leprosy	1		Tuberculosis	16	1
Malaria	[1] 42	2	Typhoid fever	[1] 47	7
Poliomyelitis	1				

[1] Includes imported cases.

JAMAICA

Communicable diseaes—4 weeks ended May 15, 1937.—During the 4 weeks ended May 15, 1937, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	9	19	Puerperal fever	1	1
Diphtheria	2		Scarlet fever		1
Dysentery	6	4	Tuberculosis	34	85
Erysipelas	1	2	Typhoid fever	9	67

YUGOSLAVIA

Communicable diseases—4 weeks ended April 25, 1937.—During the 4 weeks ended April 25, 1937, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	14		Poliomyelitis	3	2
Cerebrospinal meningitis	50	16	Rabies	1	1
Diphtheria and croup	614	64	Scarlet fever	286	5
Dysentery	27	1	Sepsis	13	1
Erysipleas	235	8	Tetanus	27	9
Lethargic encephalitis	2		Typhoid fever	120	14
Measles	696	11	Typhus fever	93	4
Paratyphoid fever	10				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 28, 1937, pages 709-722. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 25, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India.—During the week ended May 15, 1937, 1 fatal case of cholera was reported in Sind State, India.

Plague

China.—The Weekly Epidemiological Record for May 13, 1937, published by the League of Nations, states that according to a report dated May 10, several hundred deaths from bubonic plague, of which 70 percent were in children, have been reported at Hsiatangchi (Siatangtsi) in the central district of the province of Anhwei, 100 miles west of Nanking. During the months of March and April 1937 an epidemic of plague, with more than 200 deaths, was reported in the province of Fukien, at Weian (Hweian).

United States—Washington.—A report of plague infection in fleas and lice taken from ground squirrels in Adams County, Wash., appears on page 748 of this issue of PUBLIC HEALTH REPORTS.

Smallpox

Mexico—Correction.—The report of smallpox during the month of January 1937 in Ciudad Juarez, Chihuahua State, Coahuila State, and Tamaulipas State, published on page 626 of the PUBLIC HEALTH REPORTS for May 7, 1937, is an error. Information has been received stating that no smallpox was reported during the month in these localities.

Typhus Fever

Chile.—During the year 1936, 4,011 cases of typhus fever with 762 deaths were reported in Chile, of which 1,028 cases and 189 deaths occurred in Santiago, 298 cases and 45 deaths in Chillan, 279 cases and 51 deaths in Concepcion, and 205 cases and 41 deaths in San Miguel. From December 27, 1936, to March 6, 1937, 685 cases of typhus fever with 131 deaths were reported in Chile. Reports of typhus fever in certain cities for the same period were as follows: Santiago, 198 cases and 31 deaths; Chillan, 71 cases and 11 deaths; San Miguel, 54 cases and 14 deaths; Concepcion, 45 cases and 14 deaths; and Valparaiso, 21 cases and 4 deaths.

Iraq.—During the week ended May 8, 1937, 6 cases of typhus fever were reported in Diwaniyeh Province, Iraq.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Minas Geraes State, Alfenas, April 11, 1 death; Carmo do Rio Claro, March 27, 1 death; Guaxupe, April 9, 1 death; Monte Santo, April 17, 1 death (first appearance); Nepomuceno, April 6, 1 death; Rezende Costa, April 7, 1 death (first appearance); Tres Coracoes, April 10, 1 death (first appearance). Sao Paulo State, Botucatu, March 27, 1 death (first appearance); Cabreuva, March 5–11, 3 deaths (first appearance); Campinas, March 21, 1 death; Capivari, March 17, 1 death (first appearance); Cotia, March 23, 1 death (first appearance), March 30, 1 death; Parnahyba, March 8–24, 9 deaths; Presidente Prudente, March 25, 1 death (first appearance); Presidente Wenceslau, March 12–23, 3 deaths; Regente Feijo, March 15, 1 death (first appearance), March 19, 1 death; Salto, March 17, 1 death (first appearance); Santo Anastacio, March 16, 1 death (first appearance), March 21, 1 death.

Senegal.—One fatal case of yellow fever was reported in Tilmaka, Senegal, on May 18, 1937.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, JR., *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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PUBLIC HEALTH REPORTS

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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

April 25–May 22, 1937

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Typhoid fever.—Typhoid fever continued at about the lowest level on record in relation to the seasonal expectancy. For the 4 weeks ending May 22 there were 514 cases reported, as compared with 532, 629, and 843 for the corresponding period in 1936, 1935, and 1934, respectively. In the Mountain region the incidence was slightly above the average for preceding years, while in the East South Central region it was considerably below the average. Other regions reported about the normal incidence for this season.

Measles.—The incidence of measles reached its seasonal peak during the current period, with 49,148 cases reported for the 4 weeks. In relation to recent years, the current incidence was the lowest recorded for this period in the 9 years for which these data are available. In 1936 the number of cases reported totaled 52,581, while in 1935 and 1934 there were approximately 123,000 and 125,000 cases, respectively, reported during this period.

Meningococcus meningitis.—For the 4 weeks under report, 504 cases of meningococcus meningitis were reported, as compared with 912 last year and 705 in 1935. The average for the years 1932–34, inclusive, was 240 cases. The incidence in the South Atlantic and South Central regions dropped below that of last year, but it was still well above the average in those regions for preceding years. Other regions compared favorably with recent low years.

[1] From Statistical Investigations, Division of Public Health Methods, National Institute of Health. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 46; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

Influenza.—Cases of influenza continued to decline in all sections of the country. The number (4,929) reported for the current period was less than 50 percent of the number reported for the corresponding period in 1936. For this period in 1936, 1935, and 1934 the numbers of cases were 3,358, 3,918, and 3,225, respectively. The South Central and Pacific regions continued to report an excess over the average expectancy, but in all other regions the incidence was about normal for this season of the year.

Diphtheria.—The number of reported cases of diphtheria (1,544) represents the lowest incidence on record for this season. In 1936, 1935, and 1934, the cases for this period totaled 1,649, 2,044, and 2,190, respectively. The Pacific region reported an increase over last year's figure, but in other regions the incidence either closely approximated that of last year or fell considerably below it.

Scarlet fever.—The incidence of scarlet fever was about normal, with approximately 24,600 cases reported for the 4 weeks ending May 22. The seasonal decline was well under way in all sections of the country. In the North Atlantic and South Central regions the incidence was slightly above the average for preceding years, while in the South Atlantic region it was the lowest in recent years. Other regions reported about the normal seasonal incidence.

Poliomyelitis.—For the country as a whole the incidence (78 cases) of poliomyelitis was at approximately the average level of recent years, although the South Central regions continued to report a relatively large number of cases. A seasonal rise in this disease may be expected within the next month or two.

Smallpox.—The incidence of smallpox during the current period continued high in relation to recent years, with 1,142 cases reported—the highest incidence for a corresponding period since 1932. The geographic distribution of this disease has been very uneven. While more than half of the Atlantic Coast States have reported no cases since early in 1935, when the present rise in incidence began, States in the West and in the upper Mississippi Valley have continuously reported the highest incidence in recent years. In the South Central regions the incidence has been below the average for the preceding 4 years.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ending May 22, based on data received from the Bureau of the Census, was 11.8 per 1,000 inhabitants (annual basis). The average rate for the corresponding period in the years 1932–36, inclusive, was also 11.8.

REPORT OF TWO OUTBREAKS OF FOOD POISONING

By J. C. GEIGER, *Director of Public Health, San Francisco, Calif.*

Food poisoning, as it is understood today, is the result, directly or indirectly, of the contamination of food with certain bacteria. Clinically it may be classified as an intoxication. It is probably as old a condition as any of the diseases affecting the human being and consequently has been known by a much varied terminology.

The heterogeneous factors usually involved in outbreaks of food poisoning, more especially the vehicular food, the numbers of persons affected, the delayed reporting of the incident to the health authorities, and, particularly, the causative bacteria responsible, constitute a problem that too frequently does not lend itself to easy solution. Much of the information obtained has to be discarded, since it is irrelevant to the solution by accepted epidemiologic technique. As an added complication, the problem is not infrequently confused by the lack of agreement between data obtained by direct epidemiologic methods and data obtained by bacteriologic study; or specimens of the incriminated food and of feces and urine from the affected individuals even may not be available for bacteriologic investigation.

TWO TYPES OF FOOD POISONING AND INVESTIGATIVE PROCEDURES

The scientific worker generally recognizes two types of food poisoning. One type is due to the contamination of the food with the paratyphoid-enteritidis group or other bacterial organisms, either through the agency of a human or animal carrier or from the meat of an animal suffering from a specific infection with these germs. Subsequent incubation of the contaminated food through improper and insufficient cooking, refrigeration, or storage allows the bacteria to secrete, in their growth, a poisonous product, or, perhaps in the process of heating, certain products become soluble and evidently poisonous. The consumption of such food is followed within several hours by symptoms of nausea, abdominal pain, vomiting, prostration, diarrhea, and perhaps fever. Complete recovery within 48 hours is the rule. Food poisoning of this type can be prevented, and food products can be made safe through the continued use of relatively simple methods of cleanliness and proper manufacturing and merchandising surroundings and protection against contamination and incubation of the product, particularly through sterilization of equipment and thorough adequate refrigeration.

The other type of food poisoning is known as botulism, and is due to the contamination of the food with a specific bacterium known generally as the *Bacillus botulinus*. This germ is found in the soil

practically throughout the world. It exists in nature in the form of a spore and as such is not poisonous. When so-called nonacid or slightly acid foods, such as many vegetables, fish, and meat, are preserved by faulty and insanitary methods, botulinus poisoning may result from eating them. The symptoms usually appear within 24 to 48 hours after the consumption of the poisonous food. There may be marked muscular weakness, disturbances of vision, loss of ability to swallow and talk, constipation, rapid pulse and subnormal temperature, rarely any pain, and death from respiratory failure. This somewhat rare type of poisoning, serious because of its high death rate, has apparently been eliminated from commercially canned foods. Home-canning methods antedate the present-day knowledge of botulism, and it is regrettable that, with a few exceptions, little effort has been made to correct them. Only boiling for a sufficient length of time after removal from the glass jar, or can, before being served, or preservation in at least 10 percent brine solutions, will make home-canned foods reasonably safe.

A comparison of the symptomatology, incubation period, treatment, mortality, and investigative procedure in the two types of food poisoning is presented in the accompanying tabulation:

	General food poisoning	Botulism
Incubation period	Usually 3 to 8 hours; rarely over 12	Usually 24 to 48 hours.
Symptomatology	Sudden onset; nausea, vomiting, abdominal pain, prostration, diarrhea, and rise of temperature.	Delayed onset; marked muscular weakness; gastro-intestinal symptoms, rare; disturbances of vision with diplopia and blepharoptosis; loss of ability to swallow and talk; constipation, rapid pulse and subnormal temperature; rarely any pain; death from respiratory failure.
Case infectivity rate	High	Usually 100 percent.
Mortality	0 to 1 percent	Over 60 percent.
Investigative procedure.	1. Use incubation period for basis of determining the causative meal. 2. Always suspect freshly cooked or warmed-over foods. Preserved foods are rarely at fault. Foods are apparently good as to taste, appearance, odor and texture. 3. Bacteriologic examination of excreta of patients and the suspected food for the paratyphoid group and other organisms. Feeding of white mice and perhaps other laboratory animals with suspected food, both direct and by stomach tube. Likewise, injection and feeding of filtrates of bacterial organisms isolated from suspected food. 4. Bacteriologic and epidemiologic search for human carriers and possible contamination from animal sources, especially rats. Sanitary survey of source of suspected food, especially important where cream fillings or sauces are involved and the staphylococcus is the predominating organism. 5. Complications: Appendicitis, cholecystitis, persistent elevation of temperature (paratyphoid infection.)	1. Use incubation period for basis of determining the causative meal. 2. Always suspect preserved foods; likewise, meat products such as sausages. Spoilage of foods is noted in many instances. 3. Test of suspected food for toxin by animal inoculation; mice, guinea-pigs or rabbits. Test for type with specific antitoxin. Culture of suspected food for the presence of spores, particularly if food has been previously boiled. 4. Search for domestic animals, such as chickens with symptoms of limberneck, for corroborative field and laboratory evidence. 5. Complications: Broncho-pneumonia. 6. Human outbreaks are usually due to Type A toxin.
Treatment	Supportive and eliminative	Botulinus antitoxin, specific type; absolute quiet; eliminative; and glucose solutions.

Report of Two Outbreaks

OUTBREAK APPARENTLY DUE TO CUSTARD CAKES, ITALIAN STYLE, CONTAMINATED WITH STAPHYLOCOCCI

On the evening of June 21, 1936, 5 persons in family A were admitted to the Emergency Hospital in San Francisco, Calif., for the treatment of symptoms typical of the so-called general type of bacterial food poisoning (nausea, vomiting, abdominal pain, diarrhea, and prostration, without elevation of body temperature). Within 30 minutes, two members of family B were brought to the same hospital for attention because of similar symptoms. In questioning the two groups, it was apparent that, although some of the members of family A were acquainted with members of family B, they had not eaten of the same meal. Both families had had dinner at about the same hour, 1 p. m., and the symptoms and signs in those affected had manifested themselves as early as 4 p. m. in some members of the group, although the incubation period varied from 3 to 6 hours.

Within a second period of 30 minutes, Mrs. C sought care at the same hospital for typical food poisoning symptoms. She provided the first definite clue as to the cause of the food poisoning occurring in the unrelated families, and the first hint as to the possible extent of the outbreak. Mrs. C ate dinner in her own home about 1 p. m. and then went to the home of family A about 2 p. m., sat down at the dinner table with them, but ate only one slice of cake. It was then learned that both families had served the same kind of cake, a fancy cream custard layer cake, and that both cakes had been purchased, separately, from the same bakery. Within a few minutes, two members of family D were brought to the same hospital, ill from food poisoning.

From this beginning, on Sunday evening, some 110 persons of 28 families were reported on Sunday, Monday, and Tuesday as having been ill with food poisoning on Sunday and Monday. In the several separate and distinct groups, unrelated in their contact and foods except for the cream custard layer cake (Italian style, Saint Honoré cake) and living in different sections of the city, epidemiologic investigation resulted in the fixation of the source of the intoxication in the cake.

On the basis of the evidence available during the first hour after family A's admission to the Emergency Hospital, an inspection was made of the bakery involved. Two cakes of the same type as those apparently involved in the outbreak were still in the bakery. These were taken for laboratory study, and from two of the affected families remnants of the cakes were also obtained for laboratory examination.

During the evening and night, 21 persons were treated in 3 stations of the Emergency Hospital Service. With the attendant publicity

the following morning, many additional instances were reported by the affected persons themselves and by private physicians, and in several instances remnants of cakes were made available for examination by bacteriologic methods in the laboratories of the Department of Public Health. In all instances the source of the cake was invariably the same.

The Saint Honoré type of cake is somewhat elaborate, with a cream custard spread over each layer, and a decorative custard, cream, and sugar icing top. Because of past experiences in which the source of infection has been definitely traced to the cloth bags used in the injection of cream custard into pastry shells, interest was first centered in these bags as a possible source of the present infection. Attempts had been made to effect the discontinuance of the use of such appliances, since they permit of practically direct contact between the hands of the operator and the custard itself, and to encourage the use of vegetable parchment (impervious) bags, to be discarded after use. It was believed that, under the ordinary existing circumstances, even boiling such metal-tipped cloth bags was not a solution of the problem, since their handling and storage after boiling was not satisfactory.

The findings in the bakery may be briefly outlined as follows:

1. An almost total lack of screens permitted definite fly nuisance.
2. The refrigeration facilities were inadequate.
3. Canvas bags on hand showed evidence of recent use.
4. Running hot water was not available for washing equipment.
5. Free use of the bare hands was manifest throughout the period of observation. This is of particular importance in relation to the absence of hot water, infrequent washing of the hands, and actually dirty fingernails.
6. Evidence of rodent infestation in the basement was confirmed by direct verbal reports from members of the staff of the United States Public Health Service Plague Suppression Laboratory of rats trapped on these and neighboring premises, in which instances "the rats had dough in their mouths, on their feet, on their tails, and on their bellies." The basement was disorderly and badly kept, thereby encouraging rodent infestation. A wooden floor, several inches above the cement foundation floor, provided excellent avenues for rat runs.
7. By far the most interesting possibilities, however, were found in the procedures followed in the preparation of the cream custard. The custard was made in 2-gallon batches by the following method: A mixture of milk and sugar was heated and brought to the boiling temperature. In a separate container, eggs were beaten with cornstarch and sugar. When the milk and sugar mixture had been brought to boiling temperature, the heat was cut off and the cornstarch mixture was rapidly stirred in, the whole mixture rapidly thickening. After the ingredients had been mixed the whole mixture was spread out in a thin layer on a marble slab, so that the temperature was rapidly reduced approximately to that of the room. The slab was prepared for the custard only by wiping it off with an apparently dry or slightly damp, soiled cloth, and numerous flies were observed on the exposed surface. The "cooled" custard was allowed to remain on the slab for more than 30 minutes, after which time it was put in a metal container and placed in the refrigerator. (It was of some interest to observe, however, that no little difficulty was involved in securing space in the refrigerator at the time that

the custard was customarily prepared). After rinsing off the equipment with cold water, cream was whipped in an electric mixer, sugar and flavoring extracts being added meanwhile. In the preparation of the Saint Honoré type of cake, the final custard was a mixture of equal parts of the custard as described and the whipped cream, thoroughly mixed, which was spread on layers of cake by a spatula supposedly rinsed off in water. By manual process, nuts and bits of glaced fruits were added to the finished cake.

8. Milk and cream used in the baking were of pasteurized Grade A quality, purchased in small cans directly from the pasteurization plant distributor. Eggs were not of prime quality, and the "breaking" process was not conducted in a cleanly manner. The manual method was most frequently resorted to, and the personal hygiene of the hands, it should be emphasized, was not of the best.

Laboratory studies confirmed the epidemiologic findings. The material examined included cakes directly from the bakery, remnants of cakes in the homes of the affected families, and remnants of cakes brought in by others who had read of the incident in the newspapers. Bacteria colony counts of the custard filling ran as high as 10 million per gram, with several ranging from one-half to 3 million per gram. Differential studies revealed *B. coli*, *Streptococcus lacticus*, and both hemolytic and nonhemolytic strains of *Staphylococcus aureus*. In the Hooper Foundation of the University of California, heavy pigment-producing colonies of the hemolytic *Staphylococcus aureus* were put on starch-rich solid media for 60-hour cultures in an attempt to secure toxin formation under circumstances simulating those of the custard. Intraperitoneal injections of 3 cc of the filtrate of washed cultures produced marked vomiting and severe diarrhea in kittens in 25 and 40 minutes. "Control" cakes, obtained several days after the incident described, showed bacteria colony counts of from 40 to 30,000 colonies per gram the first day, 60 to 120,000 colonies the second day, and 70 to 150,000 colonies the third day, but in no instance more than 150,000 colonies per gram. Differential studies showed the predominant organism to be *B. coli* and nonhemolytic *Staphylococcus albus* and *aureus*.

Bacteriologic study of the intestinal flora of a rat caught in the same premises failed to reveal organisms of interest in relation to the epidemiology of the outbreak.

Cloth bags used in injection of pastry shells showed good growth of *Staphylococcus aureus* and other high bacteria colony counts.

SUMMARY

1. More than 110 reported cases in more than 28 families were affected in an outbreak of food poisoning traced to cream custard cakes from a single bakery.

2. Ample opportunity for contamination of the custard during its preparation, storage, and handling, were manifest on direct observation of procedures followed.

3. Laboratory confirmation of the epidemiologic investigation included high bacteria colony counts per gram of custard—*B. coli* and hemolytic and nonhemolytic strains of *Staphylococcus aureus* (heavy pigment producers); toxin formation by hemolytic *Staphylococcus aureus* on starch-rich media (produced marked vomiting and diarrhea in kittens on intraperitoneal injection). Control studies made on similar cakes several days later showed lower counts even on the third day, with *B. coli* and nonhemolytic strains of *Staphylococcus albus* and *aureus* present.

OUTBREAK OF BOTULISM APPARENTLY DUE TO EUROPEAN COMMERCIALLY CANNED ANTIPASTO

Of a group of 16 persons eating Thanksgiving Day dinner together, 10 were hospitalized for the treatment of a condition presenting the clinical picture of botulism. Of the 10 hospitalized persons 1 was found not to present evidence of the intoxication, 3 died, and 6 recovered. An additional person, who was not hospitalized, gave a history of certain symptoms and signs of interest in connection with the possibility of intoxication.

The first 5 patients admitted were those most seriously ill, including the three who died. In these cases, the onset was within 30 hours, and the group was hospitalized during the late evening hours of the day after Thanksgiving, about 36 hours following the Thanksgiving Day dinner. The three deaths occurred on the following day, within 60 hours of the dinner and within 24 hours after hospitalization. The clinical manifestations were of the "textbook type" in certain instances, less striking although definite in others and absent in one instance. In another case, early vomiting was probably responsible for the absence of signs of definite intoxication.

Epidemiologically, investigation indicated the source of the intoxication to be European commercially canned antipasto. The meal consisted of turkey with dressing, cranberry jelly, chicken broth, and mince pie. Bread and butter, coffee, potatoes (?), and one fresh vegetable (?), also were served. From the epidemiologic viewpoint, antipasto, not alone because of its being the only item of food common to all those who were affected, but also because of the possibilities offered by the product itself, is the only item of the listed menu presenting any significant probability as the source of the intoxication.

The antipasto served at the dinner was a mixture of the contents of two cans, both imported from Italy—one from Genoa and one from Trieste. At the time of hospitalization, one of the patients said he had opened the can and was impressed by the "slushy" contents thereof, which "squirted." Another point of interest involves the patient's statement that the antipasto "did not taste right." Other members of the affected group commented upon the "bitter taste"

of the mixture. It is of interest, too, that a 13-year old girl, liking the tuna fish especially, ate two pieces of it. She was the most seriously ill of the group, and the first to die. This is of significance because of the relatively high pH of tuna itself and the possibility of the use of a "honeycombed" product in the pack.

All stocks of these two brands were quarantined and samples were obtained for laboratory study. Cultures and animal tests were negative for *Cl. botulinum* and its toxin. The two cans involved were never recovered, so that positive and final proof of the source of the intoxication will never be obtained.

The investigation, however, has brought to light certain interesting points relating to the canning of such products as antipasto. One of these brands had not been regularly distributed in California for about 9 years and the stock in the involved grocery store had been on the shelves for approximately 5 years.

That botulism was the cause of death was proved in two of the fatal cases when the toxin of *Cl. botulinum*, Type A, was demonstrated in autopsy material in the laboratories of the George Williams Hooper Foundation of the University of California. The toxin was not demonstrated in the third fatal case.

It may be of interest to note that a jar of so-called canned mushrooms was found in the home. Toxicological examination of the contents of this jar made at the George Williams Hooper Foundation of the University of California revealed the presence of botulinus toxin, Type A. These mushrooms were stated to have been prepared by being boiled for 20 minutes in highly acidified water, namely, with vinegar added, and later placed in olive oil in a fruit jar with a tight top. The mother of the family involved, who prepared the infective meal, stated that she had used portions of the contents of this jar without ill effects on different occasions for 6 weeks to 2 months before Thanksgiving Day, but *not* within the 2 weeks immediately preceding Thanksgiving Day, nor were these mushrooms used on that day in the meal which caused the outbreak.

TREATMENT

Attention is invited to the use of hypertonic solutions of glucose (10 percent), intravenously, in the treatment of botulism, as employed in some of these cases. In the case of one child who recovered, the specific antisera were given in 1,000 cc of a 10-percent solution of glucose. The same quantity of glucose solution without the antisera was given again on each of 4 of the 5 succeeding days. The patient's condition was serious and even critical at times, and glucose was believed to be of great importance in his recovery. The clinical manifestations interpreted as evidence of marked intoxication were noticeably lessened in intensity after the administration of glucose alone.

In the cases of three other children who recovered, the specific antisera were administered in varying quantities in 250 cc or 300 cc of the glucose solution, without repetition of the glucose solution alone. In these cases, although there was definite evidence of intoxication, there was not the same intensity of symptoms and signs as in the case of the first child.

In the case of an adult who recovered, 10,000 units (50 cc) of the specific antisera were administered in 1,000 cc of 10-percent glucose. This patient was also given 1,000 cc of 10-percent glucose alone on 4 of 5 successive days. Improvement was definite and progressive during his convalescence.

The use of hypertonic glucose (10 percent) solutions in this small group of patients (two received 5,000 cc and 4,000 cc, respectively, over a period of 5 and 4 days, and three received 300 cc, 250 cc, and 550 cc, respectively), may be of no significance, particularly from the statistical viewpoint. From the viewpoint, however, of an attempt to evaluate clinical therapeutic procedure in cases of botulism, the results in improvement were so striking that this information has been presented here for consideration.

INCIDENCE OF SPONTANEOUS TUMORS IN A COLONY OF STRAIN C_3H MICE[1]

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REVIEW OF PREVIOUS LITERATURE

The purpose of this report is to record the incidence of spontaneous mammary gland tumors in an inbred stock of mice designated as the C_3H strain. Animals of this strain have been used for experimental work in this laboratory (*1*) and have proved to be very susceptible to the carcinogenic activity of 1, 2, 5, 6-dibenzanthracene. Hence, it may be of some interest to ascertain the incidence of spontaneous tumors in the breeding females of this strain which have been propagated in this laboratory and to compare these results with those obtained by other investigators who have recorded their findings in breeding females of the same strain of mice.

The strain was originated by Dr. L. C. Strong, who has published two communications dealing with his data on the tumor incidence in this strain. In one of these papers (*4*) the origin of the strain and the tumor incidence of one line is discussed. Strain C_3H was started in 1920 by breeding a male from the Little strain of dilute browns to a female albino mouse obtained from Dr. H. J. Bagg. Among the offspring of these mice was a female which had an exceedingly inter-

[1] From the Office of Cancer Investigations, U. S. Public Health Service, Harvard Medical School, Boston, Mass.

esting tumor history, and it is the progeny of this mouse which Strong has designated as mice of the C_3H strain. As recorded in this communication, Strong has inbred one particular line of mice by brother-to-sister matings with the exception of two "breaks" in the series when near relatives were substituted. Thirty-four generations are recorded, and every female for the last 21 generations has developed spontaneous mammary gland carcinoma. In this line, consisting of 42 females, 38 or 90.4 percent, developed spontaneous tumors of the mammary gland at an average age of 10 months, as shown in chart 2 of Dr. Strong's paper (*4*).

In his second paper (*5*) Strong includes 83 breeding females of the strain, and of these, 58, or 69.8 percent, developed spontaneous mammary growths at an average age of 13.7 months. It is shown that neither the age at which the first litter is born nor the number of litters produced have any pronounced influence on the age incidence of spontaneous tumors.

Bittner (*2*) has also reported on the tumor incidence of a stock of C_3H mice obtained from Strong. The stock had undergone 21 generations of inbreeding prior to the time he received his animals and has since undergone 12 additional generations; thus, his stock has experienced 33 generations of inbreeding. He has selected lines in which no breeding females have died free from cancer and states that in one line mammary gland tumors have been observed for 20 successive generations. Of 200 breeding females in this stock living 4 months or longer, 156, or 78 percent, developed spontaneous tumors. In a more recent paper Bittner and Murray (*3*) have compared the tumor incidence of this C_3H stock to that of three other stocks of high tumor incidence, and according to the figures presented in table 3 of this article, the average age at which tumors were noted in the 156 strain C_3H mice was 11.4 months. No correlation was detected between the incidence of mammary gland tumors and the breeding behavior of their mice.

Suntzeff, Burns, Moskop, and Loeb (*6*) used strain C_3H mice in studies on the effect of estrin on the incidence of mammary gland carcinomas and record that among 46 breeding females used as controls, 28, or 60.8 percent, developed spontaneous mammary tumors at an average age of 10.9 months.

BREEDING PROCEDURES AND TUMOR INCIDENCE

From the preceding observations it is obvious that the breeding females of strain C_3H exhibit a high rate of spontaneous mammary gland tumors. In this report an effort will be made to present the data pertaining to the tumor incidence in a colony of these mice which has been under its present supervision since January 1, 1933. The only mice included in this report are breeding females which

have given birth to one or more litters and includes all such mice under observation from January 1, 1933, to February 1, 1937. It is hoped that by giving this complete tabulation any interested reader may obtain the information he desires so far as tumor appearance is concerned.

Through the kindness of Dr. L. C. Strong, a group of six C_3H strain mice, consisting of four sisters and two brothers, representatives of the eighteenth generation of inbreeding, was procured in October 1930. These mice and their progeny were mated brother-to-sister through five or six generations prior to January 1, 1933, at which time the colony came under its present supervision.

From January 1, 1933, up to the present time the mice have been fed the same rations and no change has been made in the manner in which they have been bred or handled. Purina dog chow is the standard diet, and an unlimited supply of drinking water is available at all times. Litters are weaned at approximately 1 month of age and are then kept in a weaning cage until 6 or 8 weeks old, when the females are given numbers and all males except one removed. The cage is then considered a breeding cage. Pregnant females are removed from the breeding cage and each is placed in a separate lying-in cage. Pregnancy is usually detected about 7 to 10 days before the litter is born. As soon as a female is placed in a lying-in cage, she is given a supplementary diet of bread and milk, which is continued until the young are weaned. Part of the gestation period and all of the lactation period, as well as a few days in early life, when bread and milk are given, are the only times when any female mouse receives food other than the dog chow.

After a mouse has given birth to a litter, she is placed in a "discontinued cage" and kept under observation for the remainder of her life. This procedure is followed for every female mouse, regardless of whether her litter was eaten, died during lactation, or was successfully nursed and weaned. It is the information gathered from the life histories of these "discontinued" females which constitutes the figures presented in this report. No breaks have occurred in the brother-to-sister method of inbreeding throughout the 15 generations recorded herein.

In table 1 is presented a summary of all mice of the 16 generations under observation since January 1, 1933, to February 1, 1937. The first nine generations are completed, that is, every mouse either developed a tumor or died tumor free; consequently, a separate total for these nine generations is given in the table. A separate total is also given for the last seven generations, the records of which are still incomplete, inasmuch as in each of these generations there are still some survivors. Finally, totals are given for all 16 generations.

TABLE 1.—*Summary of all breeding females under observation from Jan. 1, 1933, to Feb. 1, 1937*

Generation	Number living on Feb. 1, 1937	Number died without tumor	Number developed tumor	Total number of mice	Percent developed tumor
F	0	5	26	31	83.8
F_1	0	14	56	70	80.0
F_2	0	18	59	77	76.6
F_3	0	28	76	104	73.0
F_4	0	21	86	107	80.3
F_5	0	9	50	59	84.7
F_6	0	11	30	41	72.9
F_7	0	25	60	85	70.5
F_8	0	23	45	68	66.1
Totals for completed generations	0	154	488	642	76.0
F_9	7	31	77	115	66.9
F_{10}	16	21	89	126	70.6
F_{11}	6	7	76	89	85.3
F_{12}	9	1	75	85	88.2
F_{13}	17	5	93	115	80.8
F_{14}	28	3	31	62	50.0
F_{15}	66	0	0	66	
Totals for incompleted generations	149	68	441	658	67.0
Total	149	222	929	1,300	71.4

In the 9 completed generations there was a total of 642 mice, and of these, 488 or 76 percent developed spontaneous mammary gland tumors. This percentage is comparable to that found by Bittner, who reported a tumor incidence of 78 percent in 200 mice of his stock of strain C_3H mice. It is also seen in table 1 that the tumor incidence varied in the different generations, fluctuating between 66.1 percent in the F_8 generation and 88.2 percent in the F_{12} generation. This difference may be due to a greater proportion of mice dying without cancer in the F_8 generation, for it appears as though practically all the female mice of this strain inherit a tendency to develop spontaneous mammary gland carcinoma.

RESULTS OF INBREEDING

On January 1, 1933, 31 female mice representing 27 litters were mated to their brothers. The only effort toward selection at that time was to breed only those mice which had common ancestors among the mice obtained from Dr. Strong. Female 49230 and male 52478 were these ancestors. Both these mice had been numbered by Dr. Strong and both were offspring from female 43226 and male 43225 of his colony. Female 49230 was born on April 16, 1930, and male 52478 was born on July 3, 1930. In this manner female 49230 was selected as the common ancestor of all the mice in this colony.

The breeding of the 31 females and their offspring was continued through five generations without any effort toward selection. At the conclusion of the fifth generation of inbreeding the results in the

various lines of mice obtained from the original 31 females were examined for any information relative to tumor occurrence or breeding habits, the purpose being to select the two best lines from the standpoint of tumor incidence for continuing the colony. It was found that the offspring of mouse 876 and mouse 492 were more satisfactory as regards tumor history than the other lines. Therefore the breeding of all other lines was discontinued and only the two more promising lines were allowed to propagate.

TABLE 2.—*Summary of 5 best tumor lines of C_3H female breeding mice after 5 generations of inbreeding*

Generation	Line 876			Line 492			Line 715			Line 757			Line 742		
	Mouse no.	Tumor	Age in months	Mouse no.	Tumor	Age in months	Mouse no.	Tumor	Age in months	Mouse no.	Tumor	Age in months	Mouse no.	Tumor	Age in months
F	876	+	16	492	+	12	715	+	18	757	+	11	742	+	21
F_1	1123	+	11	984	+	22	1061	+	19	1108	+	20	1073	+	16
F_2	1203	+	6	1177	+	14	1166	+	23	1189	+	12	1140	+	22
F_3	1295	+	9	1260	+	12	1239	−	21	1265	+	12	1207	+	17
F_4	1434	+	9	1358	+	10	1372	+	11	1385	+	17	1308	+	22
F_5	1516	+	9	1490	+	9	1460	+	15	1468	+	15	1440	−	25

The history of lines 876 and 492, as well as the three other best lines for the first five generations of inbreeding, is presented in table 2. In the table the + sign denotes the occurrence of a spontaneous mammary gland tumor and the − sign denotes the death of the mouse without tumor. It is seen that the mice of lines 876 and 492 developed tumors earlier than did those of the other lines

During the next five generations, mice of lines 876 and 492 were bred in order to ascertain which line might prove to be the better, so far as the average age of tumor occurrence was concerned. Further selection was also made by discontinuing any family of the two lines in which successive generations of spontaneous tumors were interrupted by the death of a mouse free from tumor. The results of these five further generations of inbreeding is shown in table 3, in which the mice of all generations are recorded as to their ages in months when their tumors were noted, along with the average tumor age for each generation. Mice of the F_{15} generation are omitted because none had developed a tumor up to February 1, 1937.

TABLE 3.—*Time of appearance of spontaneous mammary gland tumors in breeding females of the C_3H stock*

Generation	Number of mice	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Total number of tumor mice	Average tumor age in months	Number living on Feb. 1, 1937
Age in months		Number of mice showing tumors																									
F	31	--	--	--	--	1	2	2	2	4	2	1	6	1	2	--	--	2	--	--	--	--	--	1	26	14.9	0
F_1	70	--	--	--	2	2	2	5	1	7	9	1	6	2	2	4	5	4	1	1	--	--	2	--	56	15.6	0
F_2	77	--	1	--	1	2	5	5	6	8	11	8	3	1	--	--	4	1	1	2	--	--	--	--	59	14.0	0
F_3	104	--	--	--	--	3	1	4	10	10	7	4	4	7	4	3	5	8	4	2	--	--	--	--	76	15.8	0
F_4	107	--	--	--	2	7	10	9	5	10	7	6	8	3	4	4	2	3	4	--	--	2	--	--	86	14.2	0
F_5	59	--	--	1	2	5	2	7	3	7	3	6	4	1	2	--	2	3	--	1	--	1	--	--	50	13.8	0
F_6, line 876	9	--	--	1	1	1	2	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7	9.5	0
F_6, line 492	32	--	--	1	--	2	3	1	3	2	1	2	2	1	3	--	2	--	--	--	--	--	--	--	23	13.7	0
F_7, line 876	32	1	2	5	3	5	2	1	3	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	8.7	0
F_7, line 492	53	--	--	1	3	--	5	2	6	1	2	7	--	4	1	2	1	2	--	--	--	--	--	--	37	13.7	0
F_8, line 876	37	--	--	--	3	2	5	3	4	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	20	10.7	0
F_8, line 492	31	--	--	2	1	--	2	1	1	3	2	4	1	3	--	2	1	1	--	--	--	1	--	--	25	14.8	0
Totals of completed generations	642	1	3	11	18	30	41	41	45	54	45	40	34	23	18	15	22	24	10	6	--	4	2	1	488	14.0	0
F_9, line 876	50	--	3	2	12	5	5	8	--	--	--	1	--	--	1	--	1	--	--	1	--	--	--	--	39	9.9	0
F_9, line 492	65	1	--	2	--	3	2	3	3	5	7	2	1	2	1	3	--	1	2	--	--	--	--	--	38	13.4	7
F_{10}, line 876	70	1	2	7	4	15	11	4	4	1	2	1	3	1	--	--	--	1	--	--	--	--	--	--	57	10.1	5
F_{10}, line 492	56	--	--	--	1	3	1	6	3	2	4	3	2	2	2	2	1	--	--	--	--	--	--	--	32	13.5	11
F_{11}, line 876	79	--	4	7	23	14	9	5	4	2	--	1	--	--	--	--	--	--	--	--	--	--	--	--	69	8.9	5
F_{11}, line 492	10	--	--	--	--	1	1	2	1	--	1	--	1	--	--	--	--	--	--	--	--	--	--	--	7	11.9	1
F_{12}, line 876	85	--	--	10	17	10	16	15	3	2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	75	9.3	9
F_{13}, line 876	115	1	6	22	22	26	14	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	93	8.0	17
F_{14}, line 876	62	--	3	7	15	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	31	7.8	28
Totals for incompleted generations	592	3	18	57	94	83	59	45	18	12	16	8	7	5	4	5	2	2	2	1	--	--	--	--	441	9.7	83
Totals	1,234	4	21	68	112	113	100	86	63	66	61	48	41	28	22	20	24	26	12	7	--	4	2	1	929	[1] 12.0	83

[1] Average.

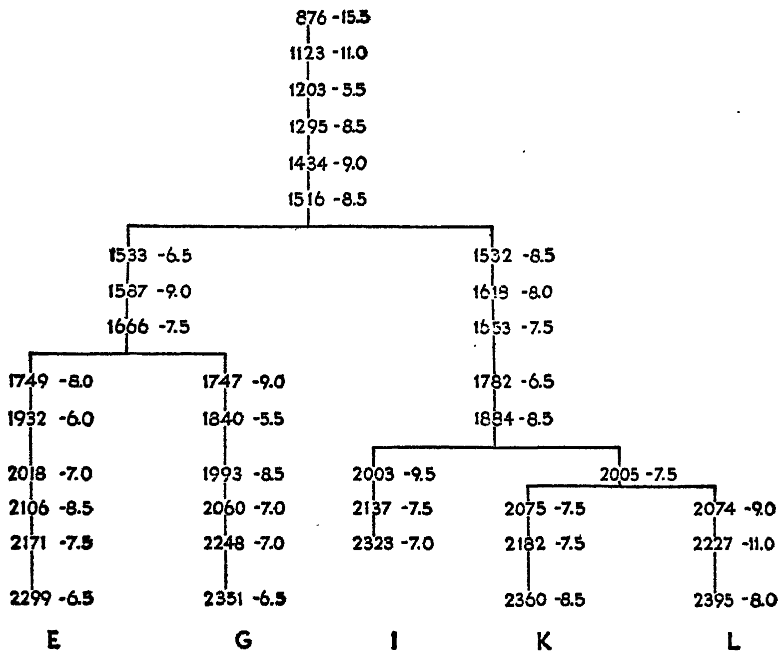
Examination of table 3 reveals no pronounced change in the average tumor age during the first six generations. For the next 5 generations, during which only line 876 and line 492 mice were propagated, the generations have been listed according to the tumors appearing in mice of these lines. It is interesting to note that selection toward a lower average tumor age had but little influence upon line 492 mice, for the average tumor age of 23 mice in the F_6 generation was 13.7 months while in 32 mice of the F_{10} generation it was 13.5 months, and 11 mice of this generation are living without having developed tumor. In view of these results, the mating of line 492 mice was stopped and only mice of line 876 are now being propagated.

As seen in table 3, mice of line 876 have a tendency to develop spontaneous tumors at an early age. Since the mice of this line are included in the figures of the first six generations in the table, it should be recorded that during these generations there were 1, 4, 5, 4, 7, and 5 mice which developed tumors at average ages of 16, 15.2, 12.4, 12.5, 10.6, and 9.8 months, respectively.

The mice of line 876 have undergone 15 generations of inbreeding since January 1, 1933, and all have a common ancestor in mouse 876.

At the present time there are 13 families of line 876 mice propagating, and, as in the past, the procedure will be to select those families which exhibit a tendency toward the development of spontaneous mammary gland tumors early in life. In the accompanying chart the ancestry of five such families is presented in outline form. Just after the number of each mouse is given the age at which it developed a tumor, and below the number of the last mouse in each family is the letter by which that particular family is known.

The ages of the mice in the chart are given in half-month periods for the purpose of comparing them with the average tumor age reported



Ancestry of 5 families of female strain C_3H mice descending from female mouse No. 876, and age at which spontaneous tumor arose in each mouse.

by Strong for his line of C_3H mice. The average tumor age for families E, G, I, K, and L is 8.3, 8.3, 8.6, 8.5, and 8.8 months, respectively. These averages compare favorably with the average tumor age of Strong's (*4*) line during the last 16 generations, which is 9.6 months.

In addition to the low average tumor age in the families of line 876, it is worthy of note that at least 50 percent of the mice develop multiple spontaneous mammary gland growths before death.

Two other tables are submitted in this report. In one of these, table 4, the ages of death of all mice dying without tumor are tabulated in months.

TABLE 4.—*Summary of ages of all female mice dying without tumor*

Age in months	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals
Generation	Number of mice dying without tumor																													
F	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	2	--	1	--	--	--	1	--	--	--	--	--	--	5
F_1	--	--	--	--	--	1	--	--	--	--	1	2	--	2	--	--	1	1	1	--	1	--	2	--	--	--	1	--	1	14
F_2	--	--	--	--	1	--	1	1	1	5	2	--	1	--	--	1	--	1	--	--	--	1	--	2	--	1	--	--	--	18
F_3	1	--	1	--	--	1	--	1	2	--	--	1	3	2	1	--	--	3	1	1	5	2	2	1	--	--	--	--	--	28
F_4	--	1	--	1	1	--	1	--	1	--	1	4	--	--	--	--	--	--	2	2	--	1	--	--	3	2	1	--	--	21
F_5	--	1	1	2	--	--	1	--	--	--	1	--	--	--	1	--	--	--	--	--	--	1	1	--	--	--	--	--	--	9
F_6, line 876	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2
F_6, line 492	--	--	--	3	--	--	--	--	--	--	--	--	1	--	--	--	1	2	1	1	--	--	--	--	--	--	--	--	--	9
F_7, line 876	--	3	1	--	--	--	3	--	1	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	9
F_7, line 492	2	--	1	--	--	1	1	--	1	--	--	1	1	--	--	2	3	1	--	1	--	--	--	--	1	--	--	--	--	16
F_8, line 876	1	2	1	3	4	--	2	2	--	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
F_8, line 492	--	1	--	--	--	--	--	--	--	1	1	--	--	--	--	--	1	1	1	--	--	--	--	--	--	--	--	--	--	6
Totals of completed generations	5	8	6	9	6	3	9	4	6	8	6	8	7	4	2	3	8	9	8	5	6	5	6	3	4	3	2	--	1	154
F_9, line 876	--	--	1	1	4	2	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11
F_9, line 492	--	--	--	--	3	--	2	4	2	--	3	1	--	--	2	--	2	--	--	1	--	--	--	--	--	--	--	--	--	20
F_{10}, line 876	--	--	3	2	1	1	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8
F_{10}, line 492	--	--	1	1	1	2	2	1	1	--	--	--	--	1	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13
F_{11}, line 876	--	--	2	--	2	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5
F_{11}, line 492	--	--	--	--	1	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2
F_{12}, line 876	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
F_{13}, line 876	--	--	--	--	2	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5
F_{14}, line 876	--	--	--	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3
Totals of incompleted generations	--	--	7	5	15	7	6	7	5	1	3	1	--	1	7	--	2	--	--	1	--	--	--	--	--	--	--	--	--	68
Totals	5	8	13	14	21	10	15	11	11	9	9	9	7	5	9	3	10	9	8	6	6	5	6	3	4	3	2	--	1	222

From the figures of table 4, it is seen that most of the mice of line 876 died before they were 8 months old.

In table 5 all living mice are tabulated according to their ages in months. Attention is directed to the fact that every mouse 17 months old or older is a mouse of line 492. But few mice of line 876 are living and free from tumor at 12 or more months of age.

TABLE 5.—*Summary of the ages of all female mice living on Feb. 1, 1937*

Age in months	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Generation	Number of female mice living																					
F_9, line 492	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	3	2	7
F_{10}, line 876	---	---	---	---	---	---	---	1	1	---	1	---	2	---	---	---	---	---	---	---	---	5
F_{10}, line 492	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	5	3	2	---	11
F_{11}, line 876	---	---	---	---	---	---	---	1	1	---	1	---	2	---	---	---	---	---	---	---	---	5
F_{11}, line 492	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1
F_{12}, line 876	---	---	---	---	---	---	1	---	2	1	3	---	1	1	---	---	---	---	---	---	---	9
F_{13}, line 876	---	3	---	---	---	---	9	1	3	1	---	---	---	---	---	---	---	---	---	---	---	17
F_{14}, line 876	---	7	---	---	---	---	17	3	1	---	---	---	---	---	---	---	---	---	---	---	---	28
F_{15}, line 876	16	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	66
Totals	16	60	---	---	---	---	27	6	8	2	5	---	5	1	---	1	1	7	3	5	2	149

SUMMARY

A record of 16 generations of breeding females of strain C_3H is submitted in this report. In these generations there is a total of 1,300 mice which have been or are under observation for the development of spontaneous carcinoma of the mammary gland. It is shown that a high percentage of the mice in every generation have developed tumor, the tumor incidence ranging from 66.1 percent to 88.2 percent in the various generations.

By selecting mice of one particular line, the average age at which tumor appeared has been lowered from 14 to 15 months in the earlier generations to 8 to 10 months in the recent generations.

REFERENCES

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DEATHS DURING WEEK ENDED MAY 22, 1937

(From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 22, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	8,311	8,387
Average for 3 prior years	8,326	
Total deaths, first 20 weeks of year	194,537	191,041
Deaths under 1 year of age	502	589
Average for 3 prior years	584	
Deaths under 1 year of age, first 20 weeks of year	11,939	11,795
Data from industrial insurance companies:		
Policies in force	69,731,099	68,290,456
Number of death claims	13,016	13,588
Death claims per 1,000 policies in force, annual rate	9.7	10.4
Death claims per 1,000 policies, first 20 weeks of year, annual rate	11.2	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 29, 1937, and May 30, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936
New England States:								
Maine		2	2	2	10	315	1	1
New Hampshire					3	8	0	1
Vermont	1				7	183	0	0
Massachusetts	7	5			697	1,125	5	7
Rhode Island		3			59	40	0	2
Connecticut	2	2		1	181	203	0	0
Middle Atlantic States:								
New York	28	45	[1] 7	[1] 12	1,565	2,430	5	6
New Jersey	7	9	1	4	1,291	376	3	3
Pennsylvania	24	30			1,969	1,560	8	12
East North Central States:								
Ohio [2]	31	27	27	22	1,839	608	9	6
Indiana	5	7	15	14	556	15	3	3
Illinois	36	33	69	27	417	21	4	5
Michigan	23	4		2	192	75	2	4
Wisconsin	4	1	19	24	58	209	0	2
West North Central States:								
Minnesota	1	7			10	419	0	1
Iowa	4	2	1		6	5	0	0
Missouri	7	5	25	36	30	14	0	2
North Dakota [3]	1			5		1	1	1
South Dakota	1	3			4		0	0
Nebraska	1	2		5	17	64	0	0
Kansas	12	4			43	5	3	0
South Atlantic States:								
Delaware					19	17	0	0
Maryland [3,4]	7	6	2	4	351	366	4	4
District of Columbia	5	9			146	148	0	0
Virginia [3]	9	10		50	465	72	11	10
West Virginia	4	5	23	35	35	48	7	8
North Carolina [3]	6	11	3	3	298	41	8	4
South Carolina	4	2	101	73	68	65	0	1
Georgia [3]	4	3					0	4
Florida	8			4		18	2	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 29, 1937, and May 30, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936
East South Central States:								
Kentucky	5	3		2	293	28	6	32
Tennessee	6	8	16	32	131	35	2	5
Alabama [2]	12	12	10	43	31	3	18	3
Mississippi	2	6					0	0
West South Central States:								
Arkansas	3	2	26	54	16	4	0	0
Louisiana	13	3	13	6	10	32	2	1
Oklahoma	10	8	4	33	60	8	1	0
Texas [2]	27	30	137	100	498	280	4	8
Mountain States:								
Montana [3]	2		1		1	8	0	1
Idaho [3]	2		12		14	16	0	1
Wyoming [3 5]					5	1	0	0
Colorado	6	5			21	44	2	0
New Mexico [3]	3	2	2	6	75	68	0	0
Arizona			31	37	41	111	0	1
Utah [4]					50	19	0	0
Pacific States:								
Washington	3			9	62	339	1	0
Oregon [3]	1	1	9	11	6	102	0	1
California [2]	33	36	52	82	310	1,567	8	2
Total	370	353	608	738	11,960	11,111	120	148
First 21 weeks of year	9,998	10,992	270,457	134,704	176,891	215,048	3,333	4,890

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936
New England States:								
Maine	0	0	18	10	0	0	2	1
New Hampshire	0	0	7	2	0	0	1	0
Vermont	0	0	22	6	0	0	0	0
Massachusetts	0	8	204	179	0	0	0	5
Rhode Island	0	0	51	23	0	0	0	0
Connecticut	0	0	133	17	0	0	0	2
Middle Atlantic States:								
New York	0	1	758	610	0	0	5	2
New Jersey	0	0	181	226	0	0	2	1
Pennsylvania	1	1	922	342	0	0	7	6
East North Central States:								
Ohio [2]	1	0	390	210	1	0	13	5
Indiana	0	0	90	88	9	0	1	1
Illinois	1	0	607	412	16	20	8	4
Michigan	1	0	773	287	0	0	2	2
Wisconsin	1	0	289	310	3	1	3	0
West North Central States:								
Minnesota	0	0	130	249	23	3	0	0
Iowa	0	1	138	154	43	42	1	0
Missouri	0	0	120	91	40	7	1	1
North Dakota [3]	0	0	82	16	29	11	2	2
South Dakota	0	0	27	26	1	20	0	0
Nebraska	0	0	47	72	2	14	0	0
Kansas	0	0	101	154	18	9	0	0
South Atlantic States:								
Delaware	0	0	3	1	0	0	2	0
Maryland [2 4]	0	0	38	38	0	0	6	0
District of Columbia	0	0	12	20	0	0	0	0
Virginia [3]	0	0	4	45	0	0	5	15
West Virginia	0	1	55	40	0	0	0	5
North Carolina [2]	2	2	30	18	0	1	7	7
South Carolina	0	0	4	4	0	0	2	2
Georgia [2]	0	0	7	10	1	0	1	7
Florida	1	0	7	4	0	0	6	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 29, 1937, and May 30, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936	Week ended May 29, 1937	Week ended May 30, 1936
East South Central States:								
Kentucky	0	0	37	17	0	0	5	6
Tennessee	1	1	9	10	0	3	5	3
Alabama [2]	1	0	4	2	1	0	4	4
Mississippi	5	0	5	9	0	0	10	2
West South Central States:								
Arkansas	0	0	13	4	11	0	2	3
Louisiana	0	0	10	6	0	0	15	10
Oklahoma	0	0	22	26	1	4	4	6
Texas [2]	1	0	120	50	5	13	16	7
Mountain States:								
Montana [3]	0	0	21	54	20	7	0	1
Idaho [3]	0	0	-------	12	6	3	1	0
Wyoming [3] [5]	0	0	13	23	3	33	0	0
Colorado	0	0	42	51	5	2	0	1
New Mexico [3]	0	1	15	35	2	0	1	1
Arizona	0	0	3	20	0	0	1	2
Utah [4]	0	0	11	39	0	2	0	1
Pacific States:								
Washington	0	0	38	32	4	3	0	1
Oregon [3]	0	0	34	25	10	0	3	2
California [2]	5	5	194	300	15	0	5	9
Total	21	21	5,791	4,379	269	198	149	127
First 21 weeks of year	454	356	140,683	154,175	6,508	4,692	2,414	2,395

[1] New York City only.
[2] Typhus fever, week ended May 29, 1937, 31 cases, as follows: Ohio, 1; Maryland, 1; North Carolina, 1; Georgia, 9; Alabama, 8; Texas, 10; California, 1.
[3] Rocky Mountain spotted fever, week ended May 29, 1937, 26 cases, as follows: North Dakota, 1; Virginia, 1; Montana, 3; Idaho, 10; Wyoming, 9; New Mexico, 1; Oregon, 1.
[4] Week ended earlier than Saturday.
[5] Colorado tick fever, week ended May 29, 1937, Wyoming, 2 cases.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1937										
Florida	15	36	118	7	18	-------	3	29	0	5
March 1937										
Florida	37	27	124	20	23	1	6	35	0	12
Puerto Rico	2	46	414	527	270	-------	1	-------	0	114
April 1937										
Arizona	5	4	196	6	1,061	4	3	78	0	2
Florida	12	25	59	11	41	-------	1	95	0	2
Hawaii Territory	1	19	21	-------	2,662	-------	0	2	0	5
Iowa	1	21	59	-------	42	-------	1	1,123	220	7
Louisiana	8	52	163	53	24	15	1	60	1	35
Montana	4	7	106	-------	67	-------	0	132	122	5
North Dakota	2	4	57	-------	3	-------	0	98	66	1
Oregon	4	2	130	1	28	-------	3	150	71	3
Texas	24	173	3,277	2,016	-------	140	12	579	-------	51
Vermont	-------	5	-------	-------	3	-------	0	23	1	0
Virginia	43	40	1,031	9	1,823	2	2	60	2	16

Summary of monthly reports from States—Continued

	Cases
February 1937	
Florida:	
Chicken pox	93
Dysentery (amoebic)	2
Hookworm disease	34
Mumps	47
Tetanus	2
Typhus fever	6
Whooping cough	20
March 1937	
Florida:	
Chicken pox	91
Dengue	1
Dysentery (amoebic)	8
Hookworm disease	942
Mumps	83
Tetanus	3
Typhus fever	6
Whooping cough	42
Puerto Rico:	
Chicken pox	97
Dysentery	19
Leprosy	2
Puerperal septicemia	3
Tetanus	18
Whooping cough	35
April 1937	
Chicken pox:	
Arizona	127
Florida	878
Hawaii Territory	130
Iowa	154
Louisiana	29
Montana	112
North Dakota	41
Oregon	136
Vermont	77
Virginia	375
Dysentery:	
Arizona	68
Hawaii Territory (bacillary)	3
Louisiana (amoebic)	3
Oregon (amoebic)	1
Virginia (diarrhea included)	47

April 1937—Continued	Cases
Encephalitis:	
Florida	6
Oregon	1
Texas	6
Virginia	1
German measles:	
Arizona	13
Iowa	33
Montana	7
Vermont	10
Hookworm disease:	
Florida	681
Hawaii Territory	6
Louisiana	32
Impetigo contagiosa:	
Hawaii Territory	19
Oregon	40
Jaundice, infectious:	
Oregon	1
Leprosy:	
Hawaii Territory	3
Louisiana	1
Mumps:	
Arizona	104
Florida	172
Hawaii Territory	86
Iowa	114
Louisiana	13
Montana	512
North Dakota	56
Oregon	72
Vermont	214
Virginia	429
Ophthalmia neonatorum:	
Hawaii Territory	1
Louisiana	1
Virginia	2
Paratyphoid fever:	
Louisiana	1
Texas	1
Virginia	2
Rabies in animals:	
Louisiana	25
Oregon	3

April 1937—Continued	Cases
Rocky Mountain spotted fever:	
Montana	3
Oregon	9
Septic sore throat:	
Iowa	6
Louisiana	1
Montana	14
Oregon	6
Virginia	6
Scabies:	
Oregon	40
Vermont	2
Tetanus:	
Hawaii Territory	3
Louisiana	3
Tick paralysis:	
Montana	1
Trachoma:	
Arizona	22
Hawaii Territory	18
Oregon	7
Tularaemia:	
Louisiana	4
Montana	1
Virginia	1
Undulant fever:	
Arizona	2
Florida	3
Iowa	13
Louisiana	4
Montana	2
Vermont	2
Virginia	4
Vincent's infection:	
North Dakota	4
Oregon	13
Whooping cough:	
Arizona	70
Florida	109
Hawaii Territory	2
Iowa	128
Louisiana	83
Montana	65
North Dakota	2
Oregon	117
Vermont	170
Virginia	429

RODENT PLAGUE IN WALLOWA COUNTY, OREG.

Under date of May 27, 1937, plague infection was reported found in tissue taken from a ground squirrel, *Citellus oregonus*, which was found dead on a ranch 5 miles northeast of Enterprise, Wallowa County, Oreg.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 22, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	196	127	43	6,829	626	2,206	19	424	32	1,414	--------
Current week	136	47	24	4,513	549	2,443	19	419	28	1,396	--------
Maine:											
Portland	0	------	0	3	3	2	0	1	0	5	41
New Hampshire:											
Concord	0	------	0	1	3	0	0	0	0	0	11
Nashua	0	------	1	2	0	1	0	1	0	0	7
Vermont:											
Barre	1	------	0	0	0	1	0	0	0	0	4
Burlington	0	------	0	0	0	1	0	0	0	0	11
Rutland	0	------	0	0	2	1	0	0	0	2	4
Massachusetts:											
Boston	4	------	1	58	13	70	0	10	0	56	202
Fall River	0	------	0	29	1	0	0	5	0	5	33
Springfield	0	------	0	3	1	6	0	1	0	4	33
Worcester	0	------	0	29	4	8	0	4	0	12	46
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	22
Providence	0	------	0	133	5	48	0	8	2	23	58
Connecticut:											
Bridgeport	0	------	0	3	1	65	0	2	0	0	34
Hartford	0	------	0	18	3	6	0	1	0	4	49
New Haven	0	------	0	1	0	3	0	0	0	0	48
New York:											
Buffalo	0	------	1	92	4	19	0	4	0	22	117
New York	25	7	1	934	125	324	0	105	7	67	*1,542
Rochester	0	1	0	3	5	8	0	5	0	13	70
Syracuse	1	------	0	37	3	31	0	0	0	29	45
New Jersey:											
Camden	1	1	1	35	2	2	0	1	0	1	34
Newark	0	------	2	162	5	15	0	3	0	13	90
Trenton	0	------	1	6	2	11	0	4	0	2	34
Pennsylvania:											
Philadelphia	5	3	2	60	22	233	0	17	1	36	443
Pittsburgh	3	1	0	222	27	49	0	9	1	30	167
Reading	1	------	0	330	0	11	0	1	0	1	25
Scranton	0	------	--------	0	------	12	0	-------	0	0	--------
Ohio:											
Cincinnati	4	------	1	126	8	28	0	7	0	8	131
Cleveland	1	4	1	470	22	124	0	8	1	54	198
Columbus	0	------	0	13	9	8	0	5	0	21	106
Toledo	1	------	0	329	4	6	0	4	0	29	55
Indiana:											
Anderson	0	------	0	5	2	2	0	0	0	2	10
Fort Wayne	0	------	0	0	4	2	0	0	0	0	24
Indianapolis	2	------	1	354	9	27	0	1	0	37	106
Muncie	0	------	0	0	2	0	0	0	0	4	15
South Bend	1	------	0	0	1	3	0	1	0	2	17
Terre Haute	1	------	0	1	0	1	0	0	0	0	18
Illinois:											
Alton	1	------	0	0	0	3	0	0	0	0	9
Chicago	21	8	2	221	42	310	0	38	2	78	672
Elgin	1	------	0	0	5	0	0	0	0	1	15
Moline	0	------	0	0	0	8	0	0	0	7	7
Springfield	1	------	0	4	3	4	0	0	0	2	24
Michigan:											
Detroit	14	------	0	46	21	406	1	23	1	59	301
Flint	2	------	0	57	4	14	0	1	0	0	24
Grand Rapids	0	------	1	65	0	13	0	1	1	23	35
Wisconsin:											
Kenosha	0	------	0	2	0	5	0	0	0	0	8
Madison	0	------	0	1	0	9	0	0	0	1	23
Milwaukee	0	1	1	17	6	63	0	4	0	18	120
Racine	0	------	0	2	0	11	0	1	0	1	11
Superior	0	------	0	0	2	7	0	0	0	5	8

City reports for week ended May 22, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Minnesota:											
Duluth	0	------	0	0	2	19	0	2	0	2	21
Minneapolis	1	------	0	4	4	35	0	2	0	45	99
St. Paul	0	------	0	1	5	4	0	0	0	84	54
Iowa:											
Cedar Rapids	0	------	------	0	------	4	0	------	0	2	------
Davenport	0	------	------	0	------	7	1	------	0	0	------
Des Moines	0	------	------	0	------	35	1	------	0	1	34
Sioux City	1	------	------	0	------	11	0	------	0	0	------
Waterloo	2	------	------	0	------	8	0	------	0	4	------
Missouri:											
Kansas City	2	------	0	2	5	54	0	3	0	28	99
St. Joseph	0	------	0	0	2	14	6	1	1	0	21
St. Louis	9	------	0	15	5	170	0	7	2	52	199
North Dakota:											
Fargo	0	------	0	1	0	2	1	0	0	6	8
Grand Forks	0	------	------	0	------	0	1	------	0	2	------
Minot	0	------	0	0	0	0	1	0	0	0	10
South Dakota:											
Aberdeen	0	------	------	1	------	2	0	------	0	0	------
Nebraska:											
Omaha	0	------	0	0	1	6	0	1	0	13	54
Kansas:											
Lawrence	0	------	0	0	0	1	0	0	0	0	5
Topeka	0	------	0	0	1	5	0	0	0	4	15
Wichita	0	------	0	8	4	2	0	0	0	17	26
Delaware:											
Wilmington	0	------	0	1	3	1	0	1	0	0	38
Maryland:											
Baltimore	0	2	1	263	17	22	0	17	2	58	226
Cumberland	0	------	0	0	1	0	0	0	0	0	15
Frederick	0	------	0	1	0	0	0	0	0	0	5
District of Columbia:											
Washington	2	------	0	107	14	14	0	15	2	10	170
Virginia:											
Lynchburg	1	------	0	6	3	0	0	1	0	3	14
Norfolk	0	3	0	12	2	2	0	1	0	29	29
Richmond	0	------	0	1	5	0	0	2	0	4	47
Roanoke	0	------	0	138	2	0	0	0	1	7	10
West Virginia:											
Charleston	0	------	0	0	1	2	0	2	0	0	20
Huntington	0	------	------	1	------	4	0	------	0	0	------
Wheeling	0	------	0	1	1	2	0	0	0	4	11
North Carolina:											
Gastonia	1	------	------	0	------	0	0	------	0	2	------
Raleigh	0	------	0	5	1	0	0	2	0	1	14
Wilmington	0	------	1	0	0	0	0	0	0	2	9
Winston-Salem	0	------	0	0	2	7	0	1	0	2	17
South Carolina:											
Charleston	0	1	0	0	3	0	0	1	1	0	19
Florence	0	------	0	0	1	0	0	0	0	0	12
Greenville	1	------	0	0	3	0	0	0	0	0	7
Georgia:											
Atlanta	0	------	0	0	11	8	0	5	0	9	83
Brunswick	0	------	0	0	0	0	0	0	0	0	7
Savannah	0	4	0	0	0	0	0	6	0	0	30
Florida:											
Miami	1	1	1	1	0	2	0	0	2	0	22
Tampa	0	------	0	25	0	0	0	0	2	3	24
Kentucky:											
Covington	0	------	1	19	0	0	0	3	0	1	22
Lexington	1	------	0	10	2	5	0	2	0	20	24
Louisville	2	1	1	40	11	16	0	6	0	50	70
Tennessee:											
Knoxville	0	------	2	0	3	0	0	0	0	0	23
Memphis	1	------	0	78	6	1	0	5	0	64	78
Nashville	0	------	0	13	2	1	0	3	0	0	40
Alabama											
Birmingham	0	1	0	22	9	1	0	6	1	10	73
Mobile	0	------	1	0	2	2	0	0	0	6	16
Montgomery	0	------	------	0	------	0	0	------	0	1	------
Arkansas:											
Fort Smith	0	------	------	1	------	1	0	------	0	0	------
Little Rock	0	------	0	3	1	4	0	3	0	0	4

City reports for week ended May 22, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Louisiana:											
Lake Charles	0		0	0	1	0	0	0	0	1	8
New Orleans	7	3	3	6	12	9	0	11	0	1	141
Shreveport	0		0	0	4	0	0	5	0	2	37
Oklahoma:											
Muskogee	0			0		2	0		0	1	
Oklahoma City	0	2	0	6	3	4	0	0	1	0	47
Texas:											
Dallas	2		0	116	3	12	0	2	0	24	63
Fort Worth	1		2	4	0	10	0	3	0	43	30
Galveston	0		0	0	0	1	0	1	0	0	14
Houston	5	2	0	1	5	1	0	2	0	11	74
San Antonio	1		1	1	3	1	0	9	0	1	69
Montana:											
Billings	0		0	0	1	0	0	0	0	0	13
Great Falls	0		0	0	1	0	0	0	0	3	8
Helena	0		0	0	0	4	0	0	0	0	1
Missoula	0		0	0	1	0	7	0	0	0	4
Idaho:											
Boise	0		0	0	1	0	0	0	0	0	5
Colorado:											
Colorado Springs	0		0	0	0	2	0	4	0	0	9
Denver	1		0	20	4	17	0	5	0	38	80
Pueblo	1		0	0	2	0	0	0	0	1	7
New Mexico:											
Albuquerque	0		0	24	3	6	0	4	0	12	16
Utah:											
Salt Lake City	0		1	41	2	3	0	0	0	15	37
Washington:											
Seattle	0		0	1	1	9	1	3	0	45	65
Spokane	0		0	12	5	1	2	0	0	6	35
Tacoma	0		0	0	1	4	0	0	0	2	31
Oregon:											
Portland	1	2	0	0	5	21	0	5	0	6	84
Salem	0			0		1	0		0	3	
California:											
Los Angeles	11	8	0	18	19	43	1	20	0	132	307
Sacramento	4		0	55	2	4	0	3	0	9	30
San Francisco	0		0	10	9	20	0	6	0	41	170

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:				Maryland:			
Boston	6	1	0	Baltimore	1	0	0
New York:				District of Columbia:			
Buffalo	1	0	0	Washington	2	2	0
New York	5	0	0	Virginia:			
Pennsylvania:				Norfolk	1	0	0
Philadelphia	2	1	0	West Virginia:			
Pittsburgh	2	0	0	Wheeling	1	0	0
Ohio:				Kentucky:			
Cincinnati	2	0	0	Louisville	2	1	0
Indiana:				Alabama:			
Indianapolis	1	0	0	Birmingham	2	2	0
Illinois:				Texas:			
Chicago	2	2	0	Fort Worth	0	0	1
Michigan:				San Antonio	0	0	1
Detroit	1	0	1	Colorado:			
Minnesota:				Denver	0	1	0
Minneapolis	1	0	0	Washington:			
Missouri:				Spokane	1	1	0
Kansas City	0	1	0	California:			
				Los Angeles	1	0	1

Encephalitis, epidemic or lethargic.—Cases: Hartford, 1; New York, 2; Cleveland, 1; Toledo, 1; St. Paul, 1; Lawrence, Kans., 2; Wichita, 1.

Pellagra.—Cases: Wichita, 1; San Francisco, 1.

Typhus fever.—Cases: Atlanta, 1; Savannah, 1. Deaths: New York, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 8, 1937.—During the 2 weeks ended May 8, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick [1]	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2						2
Chicken pox			14	209	620	37	66	10	81	1,037
Diphtheria	2	7	3	56	11	3		1	1	84
Dysentery					1					1
Erysipelas				18	7	4	4	7	6	46
Influenza	10	12		7	2	1	1		18	51
Leprosy			1							1
Measles	25	110	44	731	1,204	333	263	180	591	3,431
Mumps		11	12		495	21	7	31	35	612
Pneumonia	9	2			47		6		22	86
Poliomyelitis						1				1
Scarlet fever		16	3	182	315	36	87	124	38	801
Trachoma					1		3			4
Tuberculosis	1	18	27	106	95	29	13	7	34	330
Typhoid fever			5	45	1	2	5	1		59
Undulant fever			1	2	5	2				10
Whooping cough		9		350	226	66	85	1	14	751

[1] In the table on page 681 of the PUBLIC HEALTH REPORTS for May 21, 1937, 39 cases of diphtheria were reported in New Brunswick. This was an error. It should have read 39 cases of chicken pox. The total for chicken pox should have been 1,132 and that for diphtheria 62 cases.

FINLAND

Communicable diseases—April 1937.—During the month of April 1937, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	268	Poliomyelitis	5
Influenza	4,637	Scarlet fever	1,415
Paratyphoid fever	31	Typhoid fever	25

ITALY

Communicable diseases—4 weeks ended March 28, 1937.—During the 4 weeks ended March 28, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Mar. 1-7		Mar. 8-14		Mar. 15-21		Mar. 22-28	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	14	12	9	8	7	7	9	8
Cerebrospinal meningitis	25	23	34	29	38	35	27	23
Chicken pox	479	151	557	169	497	162	478	170
Diphtheria	507	298	502	260	403	215	479	250
Dysentery	5	5	6	6	13	9	2	2
Hookworm disease	7	3	4	4	4	4	10	5
Lethargic encephalitis	6	6	1	1			2	2
Measles	2,270	312	2,238	300	2,064	301	1,708	283
Mumps	603	132	698	145	595	129	459	122
Paratyphoid fever	21	19	25	19	29	25	22	20
Poliomyelitis	10	10	9	9	12	10	17	16
Puerperal fever	61	50	29	28	33	28	33	32
Scarlet fever	391	147	373	126	355	132	379	119
Typhoid fever	176	124	223	124	171	112	229	130
Undulant fever	81	55	84	62	92	60	113	71
Whooping cough	566	178	644	185	502	158	494	152

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 28, 1937, pp. 709-722. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 25, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Senegal—Thies Subdivision.—On May 10, 1937, 2 fatal cases of plague were reported in Thies Subdivision, Senegal.

United States—Oregon.—A report of rodent plague in Wallowa County, Oreg., appears on page 784 of this issue of the PUBLIC HEALTH REPORTS.

Smallpox

Egypt—Port Said.—During the week ended April 25, 1937, 4 cases of smallpox were reported in Port Said, Egypt.

Yellow fever

Senegal—Malem Hodar.—On May 23, 1937, 1 fatal case of yellow fever was reported in Malem Hodar, Senegal.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. ROBERT OLESEN, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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GEOGRAPHICAL DISTRIBUTIONS OF MORTALITY FROM TUBERCULOSIS, CANCER, APPENDICITIS, AND TYPHOID FEVER IN THE WHITE POPULATION OF THE UNITED STATES *

By L. L. LUMSDEN, *Medical Director, United States Public Health Service*, and C. C. DAUER, M. D., *Assistant Professor of Preventive Medicine, Tulane Graduate School of Medicine*

In recent publications [1] the geographical, or regional, distribution of tuberculosis mortality in the United States has been discussed. In this article consideration is given, especially for purposes of comparison, to the geographical distributions of mortality from (*a*) tuberculosis (all forms), (*b*) cancer and other malignant tumors, (*c*) appendicitis, and (*d*) typhoid fever, by States, among white persons in this country for the 5-year period 1929–33. The distributions of recorded mortality from these four diseases stand out in striking contrast. It seems that the method used in this article might be applied to advantage to studies of other groups of diseases.

Table 1 shows the average annual death rates for the 5-year period, the age distribution of the population for the census year 1930, and the rank of the States in the mortality rates and in the population age-grouping.

Maps 1, 2, 3, and 4 show in round numbers, by shading, the death rates from tuberculosis, cancer and other malignant tumors, appendicitis, and typhoid fever, respectively, in the States. The mortality rates presented in the table and the maps are based on population figures of the United States Census for 1930, and on mortality records of the respective State health departments. All except those for Texas and South Dakota are for the 5-year period 1929–33. Because of the wide range in racial composition of the populations of the different States, the data throughout this article are confined to the white population.

*Received for publication May 1, 1937.

[1] A survey of tuberculosis in Louisiana. By L. L. Lumsden. Public Health Bulletin No. 219.

Some features of tuberculosis mortality distribution in the United States. By L. L. Lumsden and C. C. Dauer. Public Health Bulletin No. 225.

The distribution of tuberculosis mortality in Southeastern United States. By C. C. Dauer and L. L. Lumsden. The American Review of Tuberculosis, vol. XXXV, no. 1 (January 1937) pp. 43–61.

Distribution of tuberculosis mortality in the white population of the United States. By C. C. Dauer. Public Health Reports, vol. 52, no. 3, (Jan. 15, 1937), pp. 70–75.

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TABLE 1.—*Average annual death rates from (a) tuberculosis (all forms), (b) cancer and other malignant tumors, (c) appendicitis, and (d) typhoid fever among white persons in the 5-year period 1929–33, and the age distribution of the white population in 1930, by States, in the United States*

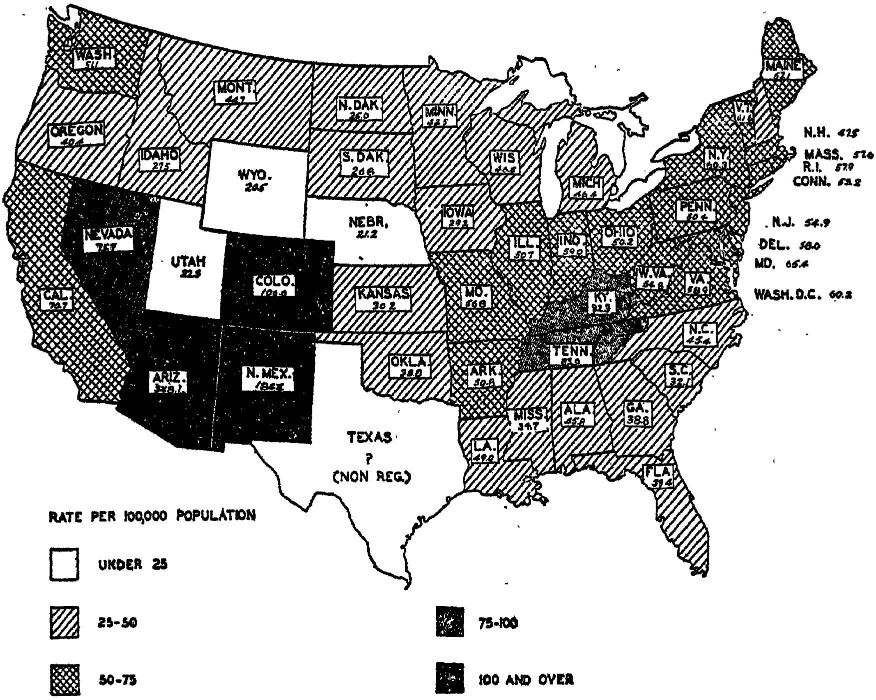
State	Death rates per 100,000 from—				White population (U. S. Census of 1930)				
	Tuberculosis (all forms)	Cancer and other malignant tumors	Appendicitis	Typhoid fever	Total	Percentage			
						Under 20 years of age	20–39 years of age	40–59 years of age	60 years of age and over
Alabama	45.8 (31)	60.0 (42)	12.2 (41)	5.05 (15)	1,700,187	47.00 (3)	29.86 (32)	17.01 (47)	6.12 (47)
Arizona	348.1 (1)	73.1 (35)	17.0 (15)	8.33 (9)	264,045	37.26 (30)	34.26 (2)	21.62 (23)	6.85 (38)
Arkansas	50.8 (23)	47.8 (48)	16.4 (17)	12.43 (1)	1,374,374	46.36 (5)	28.97 (43)	17.75 (41)	6.91 (37)
California	70.7 (7)	137.0 (5)	14.4 (33)	1.40 (40)	5,028,089	28.88 (48)	34.06 (3)	26.11 (2)	10.95 (8)
Colorado	106.6 (3)	106.9 (22)	24.7 (4)	4.95 (16)	960,483	37.23 (31)	30.51 (25)	22.45 (11)	9.81 (15)
Connecticut	53.2 (20)	123.5 (9)	12.0 (42)	0.83 (45)	1,575,765	36.99 (34)	31.20 (17)	22.27 (19)	9.50 (18)
Delaware	58.0 (14)	118.5 (12)	10.0 (46)	3.01 (24)	205,576	35.69 (40)	30.84 (21)	22.43 (13)	11.03 (6)
Florida	39.4 (36)	88.2 (26)	14.0 (35)	3.44 (19)	1,034,443	38.98 (22)	31.22 (15)	20.75 (29)	9.04 (21)
Georgia	38.8 (37)	59.8 (44)	12.4 (39)	8.59 (8)	1,836,012	45.11 (10)	30.41 (26)	17.84 (39)	6.64 (42)
Idaho	27.5 (43)	77.8 (30)	20.8 (7)	3.79 (17)	437,358	42.83 (16)	28.67 (44)	20.51 (31)	7.98 (32)
Illinois	50.7 (24)	115.7 (16)	17.1 (14)	1.62 (35)	7,259,698	35.08 (43)	33.38 (5)	22.53 (10)	8.99 (22)
Indiana	59.0 (11)	111.7 (19)	16.0 (22)	3.10 (22)	3,114,220	36.69 (36)	29.87 (31)	22.30 (17)	11.14 (5)
Iowa	29.2 (42)	118.0 (13)	17.5 (12)	1.55 (36)	2,447,184	37.36 (28)	29.70 (36)	21.70 (22)	11.23 (4)
Kansas	30.2 (41)	100.3 (24)	17.6 (11)	2.23 (29)	1,792,203	38.18 (25)	29.97 (30)	21.75 (21)	10.10 (12)
Kentucky	82.3 (5)	72.8 (36)	13.5 (37)	10.88 (4)	2,387,234	44.65 (11)	28.42 (45)	18.59 (36)	8.33 (26)
Louisiana	49.0 (27)	75.0 (34)	16.4 (18)	8.79 (7)	1,317,720	43.73 (14)	31.95 (10)	18.03 (38)	6.28 (45)
Maine	52.1 (21)	144.3 (2)	15.8 (25)	2.79 (26)	794,594	37.33 (29)	27.50 (48)	22.29 (18)	12.87 (2)
Maryland	65.4 (8)	120.6 (10)	11.2 (43)	3.08 (23)	1,351,730	36.83 (35)	31.77 (11)	21.81 (20)	9.58 (17)
Massachusetts	57.6 (16)	140.0 (3)	14.6 (32)	0.75 (47)	4,189,978	35.17 (42)	31.21 (16)	23.36 (6)	10.25 (11)
Michigan	46.4 (30)	98.1 (25)	16.0 (23)	1.47 (38)	4,647,595	37.90 (27)	32.90 (8)	20.86 (28)	8.32 (27)
Minnesota	42.5 (34)	124.9 (8)	16.3 (19)	0.72 (48)	2,538,026	38.25 (24)	30.85 (20)	21.20 (26)	9.69 (16)
Mississippi	34.7 (39)	63.3 (39)	13.6 (36)	5.48 (13)	996,483	45.81 (7)	29.74 (35)	17.59 (43)	6.85 (39)
Missouri	56.8 (17)	112.2 (18)	16.2 (20)	5.88 (12)	3,396,571	36.05 (39)	30.94 (19)	22.37 (16)	10.63 (9)
Montana	44.7 (33)	88.0 (27)	22.5 (5)	3.01 (25)	517,037	38.79 (23)	29.41 (39)	23.75 (5)	8.04 (29)
Nebraska	21.2 (47)	102.7 (23)	19.2 (8)	1.52 (37)	1,352,977	39.23 (20)	30.74 (23)	20.57 (30)	9.45 (20)
Nevada	75.7 (6)	87.0 (28)	32.4 (1)	2.46 (27)	81,383	31.48 (47)	32.75 (9)	26.98 (1)	8.78 (23)
New Hampshire	47.5 (28)	148.4 (1)	15.7 (26)	1.42 (39)	464,109	35.23 (41)	28.08 (46)	23.32 (7)	13.37 (1)
New Jersey	54.9 (18)	113.8 (17)	14.1 (34)	0.99 (43)	3,826,918	36.20 (38)	33.11 (6)	22.40 (14)	8.27 (28)
New Mexico	184.4 (2)	60.0 (43)	21.4 (6)	12.30 (2)	331,626	45.39 (8)	30.17 (28)	17.68 (42)	6.75 (41)
New York	60.3 (10)	129.0 (7)	16.0 (24)	1.08 (42)	12,140,490	33.77 (44)	34.60 (1)	22.89 (8)	8.73 (24)
North Carolina	45.4 (32)	54.3 (46)	10.0 (47)	3.39 (20)	2,233,773	48.07 (1)	29.49 (37)	16.28 (48)	6.15 (46)
North Dakota	25.0 (45)	71.8 (37)	17.2 (13)	1.97 (33)	670,860	45.34 (9)	29.00 (42)	18.71 (35)	6.95 (35)
Ohio	50.2 (26)	111.0 (20)	14.9 (30)	2.24 (28)	6,328,396	36.29 (37)	31.40 (13)	22.44 (12)	9.86 (14)
Oklahoma	38.8 (38)	57.0 (45)	16.1 (21)	8.92 (6)	2,122,602	43.94 (13)	31.62 (12)	17.82 (40)	6.61 (43)
Oregon	40.4 (35)	120.0 (11)	15.2 (28)	1.99 (31)	936,627	33.13 (46)	31.02 (18)	24.89 (3)	10.96 (7)
Pennsylvania	50.4 (25)	107.3 (21)	12.4 (40)	1.98 (32)	9,188,063	39.78 (19)	30.34 (27)	21.27 (24)	8.61 (25)
Rhode Island	57.9 (15)	137.5 (4)	15.1 (29)	0.83 (46)	676,806	37.00 (33)	30.84 (22)	22.69 (9)	9.46 (19)
South Carolina	32.1 (40)	50.5 (47)	8.4 (48)	7.88 (11)	943,822	47.60 (2)	29.47 (38)	17.05 (46)	5.87 (48)
South Dakota [1]	26.8 (44)	81.7 (29)	18.3 (9)	3.25 (21)	669,117	42.28 (17)	29.99 (29)	19.69 (32)	8.03 (30)
Tennessee	83.6 (4)	61.6 (41)	12.5 (38)	9.79 (5)	2,136,063	44.48 (12)	29.76 (33)	18.38 (37)	7.38 (33)
Texas [2]	58.9 (12)	75.3 (32)	17.0 (16)	8.17 (10)	4,280,782	41.30 (18)	33.02 (7)	18.75 (34)	6.92 (36)
Utah	22.3 (46)	75.3 (33)	25.8 (3)	2.09 (30)	495,757	46.15 (6)	29.39 (40)	17.39 (45)	7.06 (34)
Vermont	61.6 (9)	129.3 (6)	17.9 (10)	1.22 (41)	358,847	37.01 (32)	27.71 (47)	22.40 (15)	12.87 (3)
Virginia	58.9 (13)	76.9 (31)	10.5 (44)	5.17 (14)	1,769,614	43.28 (15)	29.76 (34)	18.97 (33)	7.99 (31)
Washington	51.1 (22)	116.4 (14)	14.7 (31)	1.80 (34)	1,519,351	33.59 (45)	31.34 (14)	24.77 (4)	10.30 (10)
West Virginia	54.8 (19)	62.9 (40)	10.5 (45)	11.03 (3)	1,613,363	46.54 (4)	29.08 (41)	17.54 (44)	6.84 (40)
Wisconsin	46.6 (29)	116.1 (15)	15.4 (27)	0.84 (44)	2,912,254	38.12 (26)	30.74 (24)	21.23 (25)	9.90 (13)
Wyoming	20.5 (48)	65.5 (38)	27.0 (2)	3.46 (18)	213,903	39.16 (21)	33.49 (4)	20.95 (27)	6.39 (44)

[1] Rates for 4-year period 1930–33.
[2] Rates for 1933.

NOTE.—Figures in parenthesis in rate and percentage columns indicate rank of States.

TUBERCULOSIS

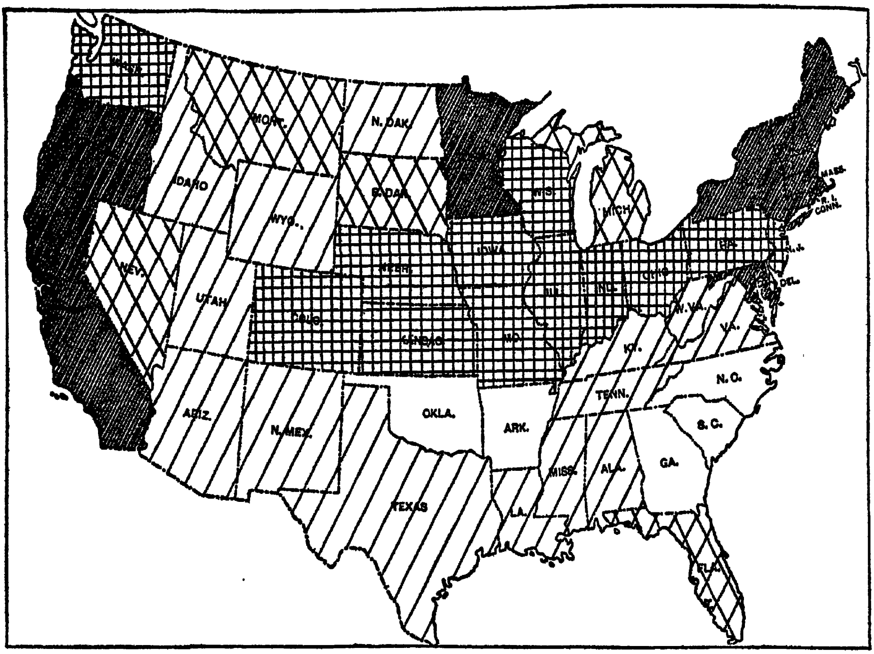
The distribution of mortality from tuberculosis in the United States has been presented in detail and discussed at considerable length in previous publications (references in footnote 1). Map 1 in this article is a reproduction of map 2 in Public Health Bulletin No. 225.



MAP 1.—Average annual death rates from tuberculosis, all forms, in the white population, 1929–33.

CANCER AND OTHER MALIGNANT TUMORS

The crude death rates presented in map 2 show that, for the total white populations of the States, cancer mortality averages much higher in two unbroken groups of contiguous States—one extending from Maine to Maryland on the east and to Colorado on the west, and one comprising the Pacific Coast States—than in other parts of the country. As cancer mortality affects mainly persons of advanced age and, as is shown in table 1, the States generally but not uniformly with the higher crude cancer death rates have a comparatively large proportion of the population composed of persons over 60 years of age, it is evident that standardization of the death rates would make a considerable difference in the figures. The difference, however, would not be enough to change much the comparative shading on map 2. In this connection, the data in table 2 are of interest. These five States were selected for comparison of the death rates in persons of the same age-sex groups because the basic data for them are available, and because three of them—Massachusetts, Connecticut,



0 TO 60 | 60 TO 80 | 80 TO 100

100 TO 120 | 120 AND OVER | MORTALITY RATES PER 100000 POPULATION

MAP 2.—Mortality from cancer and other malignant tumors in the white population, 1929–33.

and New Jersey—are fairly representative of one of the high cancer death rate zones, and two of them—Virginia and Alabama—are fairly representative of one of the low cancer death rate zones.

TABLE 2.—*Average annual death rates from cancer and other malignant tumors by age and sex in white populations per 100,000 for the 3-year period 1931–33 in Massachusetts, for the 2-year period 1933–34 in Alabama, and for the 3-year period 1932–34 in Connecticut, New Jersey, and Virginia*

Age groups	Death rates by States				
	Massachusetts	Connecticut	New Jersey	Virginia	Alabama
Male:					
0–30	6.3	5.5	5.3	5.6	6.2
30–50	52.3	50.2	51.3	38.0	33.4
50–60	260.0	273.0	325.0	165.0	157.1
60–70	668.0	639.0	691.0	400.0	421.0
70 and over	1,292.0	1,273.0	1,319.0	913.0	857.0
Female:					
0–30	6.1	5.9	5.9	5.4	6.0
30–50	112.0	102.0	130.0	86.5	93.4
50–60	380.0	382.0	367.0	273.0	301.0
60–70	683.0	640.0	685.0	500.0	515.0
70 and over	1,202.0	1,238.0	1,227.0	1,013.0	801.0

In each group of 30 years of age and over the rates for Massachusetts, Connecticut, and New Jersey are consistently and impressively higher than those for Virginia and Alabama.

In some of the States with high cancer death rates, hospital and other facilities for diagnosis and treatment are generally regarded as more nearly adequate for most of the population than those in some of the States with low cancer death rates. Sufficient detailed data on such facilities are not available to furnish a basis for an estimate of the influence of this factor on recorded cancer mortality. Better and earlier diagnosis and treatment, of course, should effect a reduction in actual mortality from cancer in a given community or State and thereby operate to some extent as an offset factor to better reporting.

In a highly interesting statistical analysis of crude cancer death rates in the United States published in the Bulletin of the Metropolitan Life Insurance Co. for June 1935, the correlation between low death rates from cancer and high death rates from senility, ill-defined, and unknown causes, based on the official records of deaths for the different States or regions, is emphasized. There appears no reason to doubt that in the States generally with low recorded cancer death rates many deaths actually caused by cancer are unreported or reported under erroneous diagnoses. Such faultiness of reporting probably applies also, but to less degree, to the States generally with comparatively high recorded cancer death rates. From the fragmentary evidence available, however, it is open to question whether, if radical improvements were made in our medical and public health services so as to bring about proper reporting and recording of 90 percent or more of all deaths actually caused by cancer, the rank of the States generally in cancer mortality as indicated in table 1 and map 2 of this article would be greatly changed.

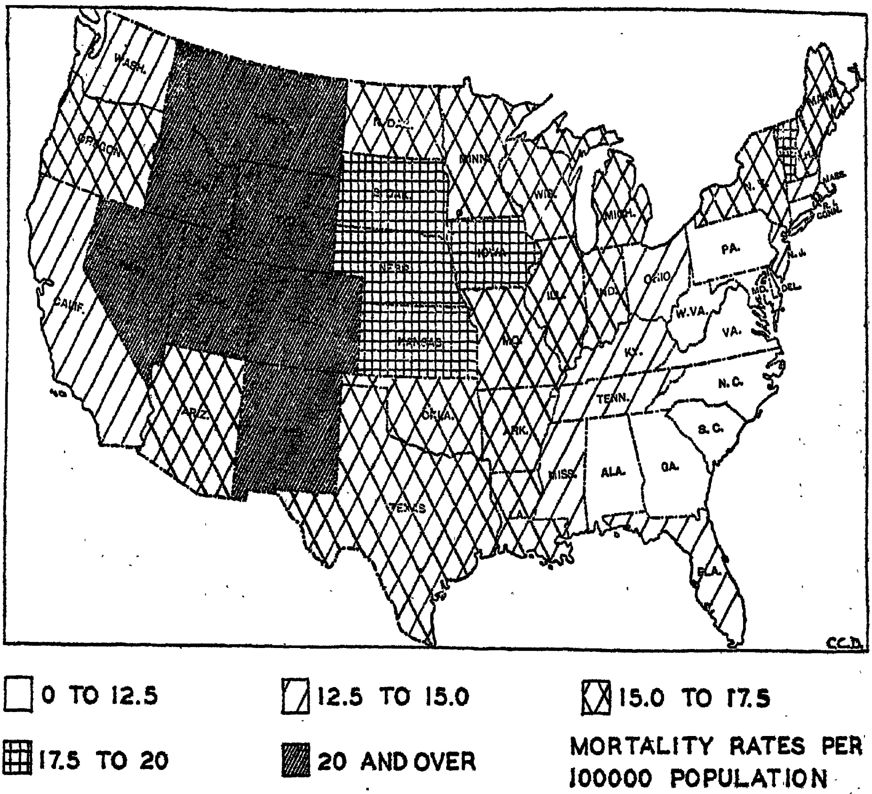
The regional distribution of cancer mortality in the United States, as now shown by the official records, obviously presents an interesting and important field for intensive surveys of medical service and for intensive epidemiological studies of environmental, familial, dietary, industrial, and other conditions.

APPENDICITIS

The concentration of high recorded mortality rates from appendicitis in the group of 11 contiguous western States, as shown by map 3, is striking and, notwithstanding the distribution of age-grouping of the State populations and the usually higher case fatality and mortality rates from this disease among middle-aged and elderly persons, stands out in sharp contrast with the high-rate cancer regions shown by map 2. The distribution of appendicitis mortality is strikingly different also from that of tuberculosis. How much of the regional distribution of appendicitis mortality is due to difference in

hospital and other medical and surgical facilities and in reporting and recording of deaths is problematical. It would appear hazardous to guess that treatment of appendicitis is over twice as good in South Carolina and Virginia as it is in Nebraska and Colorado, or that the proper reporting and recording of deaths from the disease are more than twice as nearly complete in Wyoming, Utah, and Nevada as in Maryland, Delaware, and North Carolina.

It is interesting to note the consistent decrease in the recorded death



MAP 3.—Mortality from appendicitis in the white population, 1929-33.

rates from appendicitis from State to State in lines extending eastward from the Rocky Mountain region—the rates for the States in two such lines being as follows: (*a*) Nevada, 32.4; Utah, 25.8; Colorado, 24.7; Kansas, 17.6; Missouri, 16.2; Kentucky, 13.5; Virginia, 10.5; and (*b*) Wyoming, 27.0; Nebraska, 19.2; Iowa, 17.5; Illinois, 17.1; Indiana, 16.0; Ohio, 14.9; Pennsylvania, 12.4. It is interesting also to note the markedly lower rates for the Pacific Coast States as compared with those for the Rocky Mountain States. Such geographical distribution, taken alone, suggests at least the possibility

of the operation of some geological, soil, or climatic factors upon the incidence of the disease.

Dauer and Lilly have shown in an article [2] dealing with appendicitis death rates by age groups in various geographical areas of the United States that the rates for all age groups are much higher in the Rocky Mountain area and for all age groups under 55 years are considerably lower in the South Atlantic area than in any of the other areas of this country.

The surmise or probability that the incidence rate of appendicitis is much higher in the region comprising the Rocky Mountain States and South Dakota, Nebraska, Kansas, and Iowa than in any other region of three or more contiguous States in this country is supported in considerable degree by data collected for the United States Army during the World War.[3]

In view of all the evidence yet available, it appears that appendicitis is not only a medical and surgical problem but is also an epidemiological and public health problem of importance.

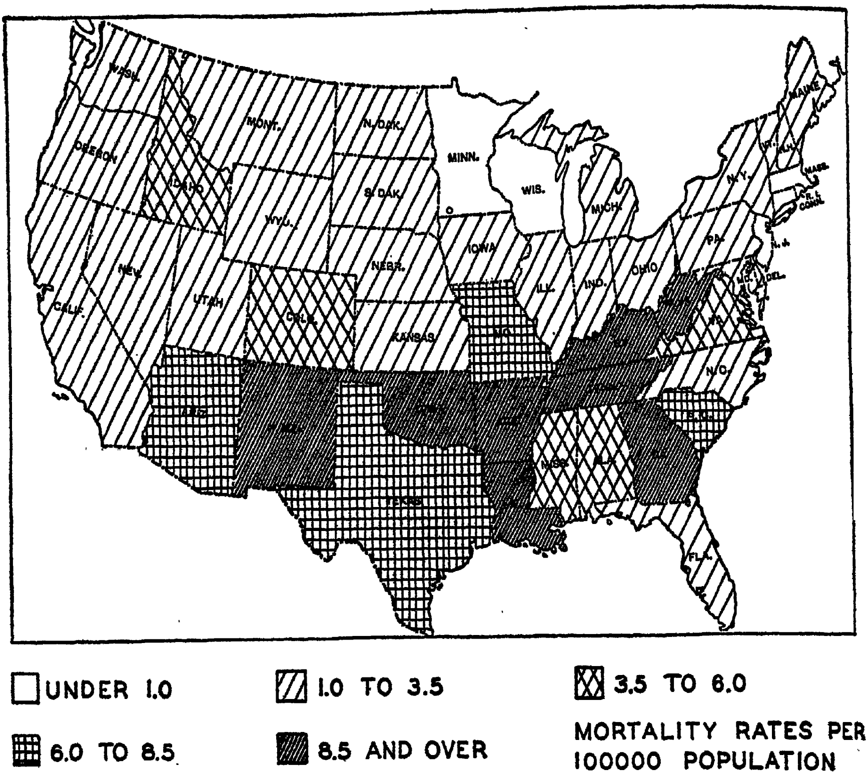
TYPHOID FEVER

Typhoid fever is one of the several diseases whose causative factors are generally supposed to be best known and understood bacteriologically and epidemiologically. Among the factors usually designated as influencing the incidence and mortality rates of this disease are environmental sanitation, water supplies, food supplies, climate, geological and soil conditions, popular education along sanitary lines, distribution of population, bedside prophylaxis and public health, medical and nursing services. The very marked reduction in mortality from typhoid fever in all regions of this country during the last 30 years appears to have followed, with convincing evidence of a relationship of cause and effect, advance in sanitary improvement or in elimination of the readily controllable causative factors, including especially insanitary excreta disposal, polluted water supplies, and contaminated food supplies.

Map 4, showing the distribution of typhoid fever mortality, presents features which, in general, are interestingly different from those presented in each of the other three maps. Here it seems we are dealing more with the known and less with the unknown. There are breaks in the groups of States or regions with the higher rates. For example, Mississippi, Alabama, Florida, Virginia, and North Carolina are adjacent to and in the same region with States to the north, east, south, or west of them which have considerably higher rates and

[2] Appendicitis mortality rates. By C. C. Dauer and G. D. Lilly. Am. J. Surg., New Series, vol. XXX, no. 1, pp. 119-124.

[3] Medical Department of the U. S. Army in the World War, vol. 15, pt. 2, 1925.



MAP 4.—Mortality from typhoid fever in the white population, 1929–33.

therefore are out of line with what otherwise might be defined a high-rate zone.

From all the evidence at hand it appears highly probable that the geographical distribution of typhoid fever mortality in the United States is largely, if not entirely, explicable by regional and local differences in the application of general sanitary measures and in climatic and soil conditions. The possibility must be admitted, however, that there are factors in the causation of this disease which are not yet known. Therefore, typhoid fever, which we are pleased to list among the vanishing enemies of mankind, still appears to present a field for important epidemiological work.

CONCLUSION

The regional distributions of mortality, and inferentially of morbidity, from tuberculosis, cancer, appendicitis, and even typhoid fever are not yet satisfactorily explicable and present important fields for detailed surveys of medical service and for practical epidemiological studies on a broad scale.

THE NEED FOR INDUSTRIAL HYGIENE COURSES IN PUBLIC HEALTH CURRICULA

By J. J. Bloomfield, *Passed Assistant Sanitary Engineer*, and R. R. Sayers *Senior Surgeon, United States Public Health Service*

It is only within the last few years that the necessity for industrial hygiene has been generally conceded, although active cooperation has been given to the United States Public Health Service in connection with its various studies in industrial establishments throughout the country. For many years the State and Provincial Health Authorities of North America have endeavored to sustain an interest in this subject through their Committee on Industrial Hygiene. It is desired to indicate briefly why the present interest in the subject is fully justified.

It is known that there are approximately 50,000,000 persons in gainful pursuits in the United States, and that of this number there are approximately 15,000,000 workers employed in industries, many of which are associated with health hazards. We are also cognizant of the fact that there are numerous specific occupational diseases associated with the industrial environment, which give rise to excessive morbidity and mortality rates in the industrial population. More important than these specific occupational diseases is the fact that the incidence of other diseases, such as tuberculosis, pneumonia, and degenerative conditions, are greater among industrial workers than among the general population. Attention has also been directed, from time to time, to the fact that the life expectancy of the industrial worker is less than that of the nonindustrial worker. It is of interest to note that, years ago, Dr. Osler said:

> It is the tragedy of today that man is so indifferent to the life of man. Yes; we surround the babe unborn with premonitory protection, deal wisely and gently with infancy and childhood, and then hurl the product of a reasonably healthy youth into a maelstrom of blind chances, of dusts, fumes, and fatigues, which wear down the stoutest body and cripple the most willing worker.

Other authoritative statements indicating the importance of industrial hygiene could be cited; however, it is believed that today everyone is convinced of the fact that industrial hygiene is indeed an important health function, and one which can best be handled through a governmental agency, such as a State or local department of health, in cooperation with industry and labor.

Prior to the passage of the Social Security Act, approved August 14, 1935, industrial hygiene work was being conducted by the Public Health Service, the Bureau of Mines, one or two universities, two or three State departments of health, and one or two State departments of labor. Although the research work conducted by the Federal Government and the universities was productive of considerable

knowledge concerning industrial health hazards, practically no application of these findings was in practice in the States. In all probability this limited work in industrial hygiene accounted for the few schools giving instruction in this phase of public health.

With the passage of the Social Security Act, when funds were made available for the development and extension of all branches of public health work in the various States, the Public Health Service, in cooperation with the Industrial Hygiene Committee of the State and Provincial Health Authorities, inaugurated a program designed for the purpose of establishing active industrial hygiene work in State and city health departments. In the short period elapsing since the passage of the act, the development of industrial hygiene activities has been rapid; and if our progress continues at the same pace it may in time attain an importance commensurate with its value to the national economy. At the present time there is an intense interest in the subject throughout the country, and there are now 23 industrial hygiene units in State and city health departments actively engaged in this work. Where less than 2 years ago the small sum of $30,000 or $40,000 was being budgeted for this activity in health departments, today nearly half a million dollars are being expended in this work. Where 2 years ago only 2 or 3 million gainfully employed persons were receiving some sort of industrial hygiene service, today approximately 35 million workers have an opportunity to be given some consideration with reference to industrial health hazards.

The progress indicated, however, has not reached its maximum. Simply compare the 15 mills per worker being expended on industrial hygiene activities in health departments to the amount of money spent per capita for other public health activities. Bear in mind the large industrial population which has been cited, the numerous problems still unsolved, the fact that it is estimated that we are spending 5 billions of dollars annually in compensation and other costs for industrial injuries and diseases, and it will readily be admitted that, phenomenal as our present growth has been, we are still only at the beginning.

However gratifying this interest and development have been, the satisfaction was not unalloyed; for, like all development, industrial hygiene expansion brought its own particular problems. In this case, the chief one was lack of trained personnel to evaluate, study, and control the inevitable health hazards arising from industrial pursuits.

The burden of this problem fell upon the Public Health Service, for two reasons—its long experience in industrial hygiene work and its administration of social security funds for this purpose. Realizing the urgency of the problem, and believing that some standard method of procedure should be set up for the guidance of industrial hygiene workers, the Public Health Service decided to give a short course of

instruction to personnel selected by the various State health departments for work in this field. Accordingly, a 4-week seminar was held during the summer of 1936, which consisted of lectures on industrial hygiene administration, health hazards, control methods, and similar subjects, as well as laboratory demonstrations of instruments used for investigative and control work.

However, where last year 36 persons were engaged in industrial hygiene work, today the number of persons active in this field in health departments exceeds 100, and we are again faced with the problem of giving some limited amount of training to the new personnel which have been employed within the last year. For this reason the Public Health Service is planning to conduct its second seminar during May and June.

There is no reason to feel that the demand for trained industrial hygiene workers will not continue for some time to come. It is now conceded that industrial hygiene is a profession in itself, an entity more or less separate and distinct from all other branches of public health. In this connection it may be well to quote the duties and qualifications established by the Committee on Industrial Hygiene of the State and Provincial Health Authorities for an industrial physician and engineer:

Under administrative direction to plan, correlate, and direct the activities of the Bureau of Occupational Diseases of the Department of Health; and to do related work as required.

For minimum qualifications this committee gave the following requirements:

Graduation in medicine from an institution of recognized standing, preferably with specialization in industrial hygiene and training in public health; a license to practice medicine; and 2 years' graduate work in industrial hygiene including ventilation, illumination, industrial toxicology, and methods of dust determinations; and 3 years' experience in public health work in relation to effect of industrial environment on health—at least one of which shall have been in directive capacity, or any equivalent combination of education and experience; advanced knowledge of the principles and practices of medicine and surgery, with particular reference to the control and elimination of industrial hazards and occupational diseases; especial ability to diagnose occupational diseases and to ascertain the specific causes of such diseases; ability to make comprehensive analyses of health conditions in industries; to draw adequate conclusions; and to prepare clear and informative reports for publication; initiative; tact; good judgment; and good address.

The duties and qualifications of the industrial hygienist or industrial hygiene engineer were given as follows:

To determine under direction the necessity of making specific studies of particular industrial conditions; to conduct surveys and supervise studies of factory conditions predisposing to occupational diseases; to prepare comprehensive reports of findings with recommendations for control of occupational disease hazards; to

supervise the work of field and laboratory workers; and to do related work as required.

The minimum qualifications call for graduation in chemical engineering, with 2 years' graduate work in industrial hygiene—to include ventilation, illumination, industrial toxicology, dust determinations; 3 years' experience in surveys and studies of industrial conditions for occupational disease control; or any equivalent combination of education and experience; familiarity with materials and processes used in industry; thorough knowledge of physical and chemical procedures for necessary determination of occupational disease hazards and of methods of control of these hazards; ability to recognize industrial processes and materials presenting potential occupational disease hazards; ability to enlist cooperation of plant executives, foremen, and laborers; initiative; tact; good judgment; and good address.

It goes without saying that a public health background is highly desirable for those undertaking industrial hygiene work.

It is apparent, therefore, that in view of the widespread interest in industrial hygiene, which in turn creates a demand for trained personnel, and because of the especial qualifications necessary to conduct industrial hygiene work successfully, adequate instruction should be available for those wishing to prepare themselves for a career in this field. In addition to the personnel now needed in State and city departments of health, there is also a demand for trained industrial hygienists in industry. It is evident that trained personnel will be in demand for many years to come.

It is not the purpose of this discussion to present in detail the type of instruction which should be given in our universities to industrial hygiene students. However, it is felt that at least 1 year's work should be devoted to the various topics coming within the scope of industrial hygiene. There should be sufficient laboratory work to acquaint the student with the various instruments and methods used in evaluating health hazards in industry, and, most important of all, practical training should be given to the students in the field. This could often be accomplished by detailing a student to a health department actively engaged in industrial hygiene.

Since any courses given by the Public Health Service would necessarily be of a limited nature, the logical solution is the institution of industrial hygiene courses in colleges and universities as a part of their regular or post-graduate curricula. Too much stress cannot be given to the necessity for such instruction, in order that industrial hygiene workers may deal with the problems concerning the health of workers in a manner that will produce substantial improvement and real progress in industrial life with the greatest efficiency and economy.

EVALUATION OF THE INDUSTRIAL HYGIENE PROBLEMS OF A STATE

Only within the last few years has it been generally conceded that industrial hygiene is an important public health problem and as such should be the concern of State and local health departments. In view of the great interest now being shown in this subject and the progress being made in this activity throughout the United States, the need for a program which may be followed by those inaugurating industrial hygiene work becomes obvious.

The United States census for 1930 shows that, at that time, there were approximately 49 million persons gainfully employed in the United States. Of this number, manufacturing and mechanical and mineral industries accounted for nearly 15 million workers. If the term "industrial hygiene" means protection of the health of the worker, it is at once apparent that this is a major problem in public health.

More important than specific occupational diseases associated with the industrial environment is the fact that the incidence of other diseases, such as tuberculosis, pneumonia, and degenerative conditions, is greater among industrial workers than the general population. It has also been shown that the life expectancy of the industrial worker is less than that of the nonindustrial worker.

In recent years large industrial establishments have contributed much toward protecting the health of their workers. However, as nearly 90 percent of the plants in the United States employ less than 100 persons, many establishments are not prepared to cope effectively with the problems of industrial hygiene alone. It would seem, therefore, that the protection of the health of our workers is indeed an important health function and one which should be handled through a governmental agency, such as a State or local department of health, cooperating with the employers, workers, and other agencies concerned with this problem.

There has been a realization upon the part of those responsible for the administration of industrial hygiene that one of the first steps in the inauguration of a program is to obtain a comprehensive conception of the extent of the problem as it exists today. Such a conception, in the absence of definite industrial morbidity and mortality statistics, may be approximated by a preliminary survey of the industrial establishments of a locality. A procedure which may be followed by a State organization in initiating a program in this field is presented in detail in Public Health Bulletin No. 236,[1] issued by the Public Health Service.

[1] The Evaluation of the Industrial Hygiene Problems of a State. By J. J. Bloomfield and Mary F. Peyton. Public Health Bulletin No. 236. Government Printing Office, Washington, D. C., 1937.

This bulletin presents the results of a preliminary survey of industrial establishments recently made in the State of Maryland. It is felt that the procedure followed in Maryland could be applied in other States confronted with similar problems. Factual information on industrial welfare facilities in the establishments surveyed in Maryland is presented in this bulletin, and the number of persons exposed to the various materials in these industries which may be hazardous to health is also shown. Such data should prove very useful to that agency whose duty it will be to conduct a future program of prevention.

The various forms used in obtaining the information in industry are presented in appendix A to this Bulletin, which also contains the numerous forms used in tabulating the information, a manual for conducting plant surveys, and an explanation of the methods employed in analysis and presentation of the data. Appendix B contains a detailed list of equipment useful in conducting medical and engineering studies in industrial hygiene, while appendix C presents information with reference to the development of a library on industrial hygiene. This appendix also contains references to the literature arranged by subject.

PROVISIONAL MORTALITY STATISTICS FOR 1936 [1]

According to provisional tabulations by the Bureau of the Census, there were 1,474,177 registered deaths in 1936 in the United States. This figure indicates an increase of 81,425 over the 1,392,752 deaths reported for 1935. It is a reflection of a general increase in mortality in most of the States. In 43 States and the District of Columbia there was an increase in the number of deaths in 1936 over that reported in 1935. Only the States of comparatively small population, Montana, New Hampshire, New Mexico, North Dakota, and South Dakota, showed decreases.

The increase of 81,425 deaths has advanced the death rate from 10.9 per 1,000 in 1935 to 11.5 in 1936. This 1936 death rate is the highest death rate recorded for the mortality registration area since 1929.

As may be expected from the increase in the number of deaths, practically every State experienced a comparable increase in the death rate. Greatest increases in the rate were in Mississippi, Missouri, Nevada, and Louisiana.

The highest death rates are for Arizona, 15.5; District of Columbia, 14.7; Nevada, 14.4; New Mexico, 13.8; and Maine, 13.3. The lowest death rates are for North Dakota, 8.0; South Dakota, 8.7; Oklahoma, 9.2; Arkansas, 9.2; and Utah, 9.9. Certain cautions must be exer-

[1] Vital Statistics—Special Reports, vol. 3, no. 22, p. 109, June 7, 1937. Bureau of the Census, Department of Commerce.

cised in interpreting differences in the crude death rate as indicating differences in health conditions. All areas do not have the same age, sex, and racial distributions of the population, and these factors, among others, influence the death rate. Full explanation of the 1936 mortality increase cannot be given until a detailed tabulation of the causes of death is completed. Cause of death tabulations are now being made but will not be completed until late in 1937.

All data for the years prior to 1936 are final tabulations. Figures for 1936 are based on hand counts of copies of death certificates received from State offices of vital statistics. For the States for which the shipment of copies to the Bureau of the Census is complete, these provisional figures will agree closely with the final tabulations. In other States it may be expected that a few delayed certificates will be added before final tabulations are completed. For Colorado, Illinois, Rhode Island, and New York State (excepting New York City which has made complete returns), transcripts for only 11 months, have been received; while for Arizona transcripts for only 10 months have been received. In such cases the 1936 provisional figure is based on the available 1936 data and 1935 data for the months for which 1936 data are lacking. The State total for Massachusetts is taken from the State tabulations.

Number of deaths (exclusive of stillbirths) from all causes in each State, 1932–36

State	1936 [1]	1935	1934	1933	1932
Registration States	1,474,177	1,392,752	1,396,903	1,342,106	1,308,529
Alabama	30,417	28,585	29,361	27,104	27,680
Arizona	6,307	6,077	5,647	5,539	5,420
Arkansas	18,515	16,176	16,888	16,597	16,315
California	75,869	72,456	68,095	68,036	67,680
Colorado	13,520	13,134	12,497	11,961	12,599
Connecticut	17,859	17,659	17,438	17,444	16,962
Delaware	3,317	3,208	3,354	3,309	3,178
District of Columbia	9,093	8,483	8,274	7,872	7,937
Florida	20,960	20,046	20,357	18,759	18,288
Georgia	37,272	34,288	35,580	31,194	32,128
Idaho	4,918	4,531	4,377	4,056	3,942
Illinois	91,541	85,518	87,205	82,513	83,180
Indiana	42,471	39,515	40,650	38,009	38,756
Iowa	28,303	26,364	26,758	25,665	25,786
Kansas	21,673	20,334	19,951	19,613	19,512
Kentucky	31,716	29,370	30,148	28,520	29,059
Louisiana	25,946	23,711	23,254	23,112	23,311
Maine	11,334	11,024	10,937	11,102	10,719
Maryland	21,960	21,182	20,946	20,610	21,038
Massachusetts	51,435	50,237	50,580	50,811	49,446
Michigan	54,782	51,050	50,442	48,536	49,585
Minnesota	28,633	26,247	26,570	25,306	25,591
Mississippi	24,134	21,330	21,832	21,666	20,311
Missouri	48,770	43,201	46,639	42,521	43,788
Montana	6,256	6,291	5,617	5,212	5,294
Nebraska	13,758	13,181	13,372	12,924	12,922
Nevada	1,440	1,324	1,297	1,233	1,342
New Hampshire	6,439	6,532	6,397	6,491	6,329
New Jersey	44,959	43,284	43,819	43,497	42,914
New Mexico	5,807	6,272	6,115	5,824	5,968

[1] 1936 figures are provisional.

Number of deaths (exclusive of stillbirths) from all causes in each State, 1932–36–Continued

State	1936	1935	1934	1933	1932
New York	153,475	148,462	149,088	148,455	147,824
North Carolina	35,616	33,485	35,180	30,547	31,051
North Dakota	5,599	5,860	5,844	5,463	5,153
Ohio	80,947	77,356	77,101	73,054	76,286
Oklahoma	23,261	21,091	21,373	20,309	19,285
Oregon	12,372	11,430	10,540	10,450	10,277
Pennsylvania	112,727	108,555	109,601	106,109	109,204
Rhode Island	8,101	7,838	7,703	7,895	8,080
South Carolina	21,316	20,353	21,312	19,356	19,884
South Dakota	6,033	6,316	6,455	6,104	5,725
Tennessee	32,532	30,002	30,312	28,123	28,628
Texas	65,614	61,663	59,731	58,948	(1)
Utah	5,113	5,066	4,841	4,384	4,420
Vermont	4,961	4,777	4,878	4,621	4,753
Virginia	32,201	30,358	30,559	28,454	28,898
Washington	19,349	18,203	17,552	16,705	16,581
West Virginia	19,909	18,340	17,941	16,605	17,912
Wisconsin	33,242	30,694	30,399	29,513	30,321
Wyoming	2,405	2,284	2,096	1,975	2,057

[1] Not in registration area.

Death rates (number of deaths per 1,000 estimated population) for each State, 1927–36

State	1936 [1]	1935	1934	1933	1932	1931	1930	1929	1928	1927
Registration, States	11.5	10.9	11.0	10.7	10.9	11.1	11.3	11.9	12.1	11.4
Alabama	10.6	10.1	10.5	9.8	10.1	10.5	11.4	12.4	12.3	10.5
Arizona	15.5	15.0	13.9	13.4	12.9	14.3	15.4	15.9	15.4	14.4
Arkansas	9.2	8.1	8.5	8.5	8.5	9.4	10.2	10.5	10.9	10.0
California	12.5	12.1	11.5	11.6	11.6	11.7	11.6	11.9	12.5	12.1
Colorado	12.7	12.4	11.8	11.4	12.0	11.9	12.7	12.5	13.8	13.0
Connecticut	10.3	10.3	10.3	10.4	10.2	10.5	10.7	11.5	11.4	10.8
Delaware	12.8	12.5	13.3	13.2	12.9	13.6	13.6	13.2	13.6	12.8
District of Columbia	14.7	14.3	14.8	14.5	15.1	15.2	15.0	15.4	15.1	14.7
Florida	12.8	12.4	12.8	12.0	11.9	12.0	12.4	12.7	13.7	13.6
Georgia	12.2	11.3	11.8	10.4	10.8	11.2	12.1	12.2	12.4	(2)
Idaho	10.1	9.5	9.3	8.7	8.6	8.8	9.3	9.2	9.4	8.6
Illinois	11.7	10.9	11.2	10.6	10.8	11.2	10.9	11.6	12.1	11.3
Indiana	12.3	11.5	12.0	11.3	11.6	11.8	12.1	12.7	12.7	11.9
Iowa	11.1	10.4	10.6	10.2	10.3	10.3	10.6	10.4	10.3	10.0
Kansas	11.5	10.8	10.7	10.5	10.4	9.9	10.4	10.4	11.2	10.0
Kentucky	11.0	10.3	10.7	10.3	10.7	10.8	11.2	12.0	11.8	10.6
Louisiana	12.2	11.2	11.0	10.9	11.0	11.1	11.7	11.9	12.2	11.8
Maine	13.3	13.0	13.1	13.4	13.1	13.0	13.9	14.3	13.9	13.9
Maryland	13.1	12.7	12.6	12.4	12.7	13.2	13.2	13.5	13.6	13.3
Masshacusetts	11.6	11.5	11.7	11.8	11.5	11.4	11.6	12.3	12.2	11.9
Michigan	11.5	10.8	10.8	10.3	10.4	10.3	10.7	11.8	11.8	11.2
Minnesota	10.9	10.0	10.1	9.7	9.9	9.8	10.0	10.1	10.3	9.8
Mississippi	12.0	10.6	10.9	10.8	10.1	11.0	12.0	13.0	13.1	11.9
Missouri	12.3	11.0	12.1	11.1	11.6	11.9	11.8	12.3	12.6	11.4
Montana	11.8	11.8	10.6	9.8	9.9	9.9	10.1	10.7	10.7	9.9
Nebraska	10.1	9.7	9.8	9.4	9.4	9.4	9.7	9.8	10.0	9.1
Nevada	14.4	13.4	13.2	12.8	14.1	14.5	12.7	13.3	(2)	(2)
New Hampshire	12.7	13.0	12.9	13.3	13.1	12.5	13.5	14.1	14.0	13.8
New Jersey	10.4	10.1	10.3	10.4	10.3	10.8	10.7	11.6	11.6	11.1
New Mexico	13.8	14.9	14.5	13.8	14.1	14.6	15.6	15.4	(2)	(2)
New York	11.9	11.5	11.6	11.6	11.6	11.7	11.7	12.4	12.4	11.7
North Carolina	10.3	9.8	10.4	9.2	9.5	10.2	11.2	11.8	11.8	10.9

[1] 1936 figures are provisional.
[2] Not in registration area.

Death rates (number of deaths per 1,000 estimated population) for each State, 1927–36—Continued

State	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927
North Dakota	8.0	8.4	8.4	7.9	7.5	7.5	7.9	8.0	8.2	7.8
Ohio	12.1	11.5	11.5	10.9	11.4	11.3	11.5	12.4	12.3	11.5
Oklahoma	9.2	8.4	8.6	8.2	7.9	7.7	8.2	9.0	9.0	[2]
Oregon	12.2	11.3	10.6	10.6	10.5	10.6	11.0	11.3	11.3	11.2
Pennsylvania	11.1	10.8	11.0	10.7	11.1	11.5	11.6	12.3	12.6	11.9
Rhode Island	11.9	11.5	11.3	11.6	11.8	11.6	11.7	13.1	12.5	11.9
South Carolina	11.5	11.1	11.7	10.7	11.1	11.9	12.9	13.3	14.1	12.6
South Dakota	8.7	9.1	9.3	8.8	8.3	8.5	8.5	[2]	[2]	[2]
Tennessee	11.4	10.6	10.9	10.2	10.6	10.7	11.4	12.2	12.2	11.4
Texas	10.7	10.1	9.9	9.8	[2]	[2]	[2]	[2]	[2]	[2]
Utah	9.9	9.8	9.4	8.5	8.6	8.8	9.9	10.1	10.3	9.6
Vermont	13.1	12.7	13.0	12.5	12.9	12.3	13.0	14.7	13.6	13.6
Virginia	12.1	11.5	11.7	11.1	11.5	12.1	12.5	13.0	12.6	12.0
Washington	11.8	11.1	10.8	10.4	10.4	10.4	10.6	10.6	10.9	10.6
West Virginia	10.9	10.1	10.0	9.3	10.1	10.0	10.5	10.6	10.4	10.2
Wisconsin	11.4	10.6	10.5	10.1	10.4	10.3	10.4	10.7	11.0	10.4
Wyoming	10.3	9.8	9.1	8.6	9.0	8.9	9.2	9.0	9.8	9.1

[2] Not in registration area.

ORGANIZATION OF ANTITUBERCULOSIS CAMPAIGN IN COLOMBIA

A law passed by the Colombian Congress and signed by the President on March 5, 1937, outlines the antituberculosis campaign and places it under the direction of the National Department of Health. The following are the principal provisions of the law:

The establishment of dispensaries in the capital of each department and other places as needed, new hospitals or sections of existing hospitals, where dispensaries are located, with separate rooms for incurables and patients under treatment, sanatoriums in localities with suitable climate and in proximity to centers of infection and preventoria to care for subnormal children likely to become infected and those lightly infected. The National Department of Health is authorized, after a study of the problem, to provide antituberculosis vaccination.

In order to further the campaign, the Government will issue an antituberculosis stamp and create antituberculosis associations such as those established in other countries; and for carrying on the campaign, a sum of not less than 300,000 pesos is authorized to be appropriated annually for the next 10 consecutive years.

Compulsory instruction in the prophylaxis of infectious diseases, especially tuberculosis, is to be required in the primary and secondary schools, and annual chest examination of teachers in all schools and colleges is made compulsory, as well as of children where there is an official medical service.

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DEATHS DURING WEEK ENDED MAY 29, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 29, 1937	Corresponding week, 1936
Data from 86 large cities in the United States:		
Total deaths	8,452	7,792
Average for 3 prior years	8,329	
Total deaths, first 21 weeks of year	202,987	198,834
Deaths under 1 year of age	529	524
Average for 3 prior years	577	
Deaths under 1 year of age, first 21 weeks of year	12,468	12,318
Data from industrial insurance companies:		
Policies in force	69,764,846	68,309,902
Number of death claims	13,172	13,580
Death claims per 1,000 policies in force, annual rate	9.8	10.4
Death claims per 1,000 policies, first 21 weeks of year, annual rate	11.1	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 5, 1937, and June 6, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936
New England States:								
Maine		1			25	699	0	0
New Hampshire					157	30	0	0
Vermont					2	274	0	0
Massachusetts	3	7			647	1,362	3	8
Rhode Island		1			81	63	0	0
Connecticut	9	2		3	149	218	0	3
Middle Atlantic States:								
New York	35	38	[1] 6	[1] 3	1,653	2,746	11	8
New Jersey	7	16	6	9	1,741	605	1	3
Pennsylvania	24	48			2,058	919	8	10
East North Central States:								
Ohio	15	19	22	5	2,977	610	5	9
Indiana	7	11	16	16	935	9	1	2
Illinois [2]	32	51	15	57	454	32	2	8
Michigan	11	13	1		181	43	2	2
Wisconsin	2	3	23	10	98	241	0	0
West North Central States:								
Minnesota	4	2	1		17	311	1	1
Iowa	2		2		7	3	0	1
Missouri	15	24	36	26	71	21	1	6
North Dakota	2		36		2	7	0	1
South Dakota		4			4	8	0	0
Nebraska		7			27	19	0	0
Kansas	3	8	3	1	19	10	1	1
South Atlantic States:								
Delaware					37	23	1	0
Maryland [3] [4]	5	4	2		259	322	3	5
District of Columbia	4	10	1		110	100	4	2
Virginia [4]	8	8		38	379	72	12	13
West Virginia	7	14	11	18	59	46	3	6
North Carolina [2]	12	8	1	2	309	70	5	6
South Carolina	2	4	63	63	64	24	1	2
Georgia [2]		9					0	4
Florida [2]	10		3	2		14	1	3
East South Central States:								
Kentucky	10	5	8	12	475		5	9
Tennessee	3	9	20	18	120	15	5	2
Alabama [2]	11	7	27	15	33	6	8	3
Mississippi	2	6					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 5, 1937, and June 6, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936
West South Central States:								
Arkansas	3	1	12	7	3	3	0	0
Louisiana	8	14	9	4	9	13	0	3
Oklahoma	6	1	6	43	48	15	1	3
Texas [2]	36	23	156	83	389	241	5	1
Mountain States:								
Montana [4]		1		2	3	2	0	1
Idaho [4]			4		25	11	2	0
Wyoming [4]		1			5	4	0	1
Colorado [4]	1	4			23	31	1	1
New Mexico	1	7	1	6	52	47	0	2
Arizona	1		21	22	33	86	0	0
Utah [3]				6	80	50	0	0
Pacific States:								
Washington	10			3	40	299	0	0
Oregon [4]			8	10	4	97	0	0
California [4]	21	37	50	538	305	1,603	3	3
Total	332	431	570	1,022	14,160	11,424	96	133
First 22 weeks of year	10,330	11,423	271,027	135,726	191,060	226,472	3,428	5,023

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936
New England States:								
Maine	0	0	22	8	0	0	2	3
New Hampshire	0	0	32	11	0	0	0	0
Vermont	0	0	6	5	0	0	0	0
Massachusetts	1	4	217	235	0	0	1	2
Rhode Island	0	0	45	21	0	0	1	0
Connecticut	0	0	107	42	0	0	2	1
Middle Atlantic States:								
New York	4	3	566	655	0	0	8	2
New Jersey	0	0	131	248	0	0	2	3
Pennsylvania	0	2	434	436	0	0	6	7
East North Central States:								
Ohio	2	1	508	186	2	0	3	10
Indiana	0	0	137	73	30	7	1	6
Illinois [2]	0	5	401	453	22	12	8	6
Michigan	1	1	418	205	2	0	5	0
Wisconsin	0	1	207	301	2	16	3	0
West North Central States:								
Minnesota	0	0	117	221	26	6	0	0
Iowa	0	0	107	121	22	15	0	0
Missouri	1	0	196	104	30	3	9	2
North Dakota	0	0	23	38	21	6	0	1
South Dakota	0	0	24	41	2	8	0	0
Nebraska	2	0	54	47	4	27	0	0
Kansas	0	1	87	155	13	20	3	2
South Atlantic States:								
Delaware	0	0	2	1	0	0	0	0
Maryland [2, 4]	0	0	20	49	0	0	7	2
District of Columbia	0	0	3	12	0	0	2	0
Virginia [4]	0	0	10	26	0	0	7	6
West Virginia	0	0	56	31	1	0	3	4
North Carolina [2]	0	1	20	20	1	0	3	5
South Carolina	1	0	5	3	0	0	12	5
Georgia [2]	1	0	6	17	0	3	6	11
Florida [2]	0	0	0	4	0	0	1	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 5, 1937, and June 6, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936	Week ended June 5, 1937	Week ended June 6, 1936
East South Central States:								
Kentucky	2	0	35	21	0	0	8	8
Tennessee	0	0	15	17	0	0	4	6
Alabama [2]	0	0	4	2	0	0	2	5
Mississippi	9	0	1	8	0	1	2	7
West South Central States:								
Arkansas	1	0	6	2	0	0	10	1
Louisiana	1	0	15	3	0	0	16	16
Oklahoma	0	0	19	-------	8	1	7	2
Texas [2]	[5]3	1	84	31	5	1	24	6
Mountain States:								
Montana [4]	0	0	12	59	15	8	0	3
Idaho [4]	0	0	10	11	1	3	3	0
Wyoming [4]	0	0	10	39	3	7	2	0
Colorado [4]	0	2	30	73	3	1	0	0
New Mexico	0	1	14	59	0	0	3	10
Arizona	0	0	13	14	0	0	0	1
Utah [3]	0	0	8	26	0	19	0	0
Pacific States:								
Washington	0	0	29	54	1	4	1	1
Oregon [4]	1	0	29	30	20	0	4	10
California [4]	6	3	175	296	8	3	11	14
Total	36	26	4,470	4,514	242	171	192	172
First 22 weeks of year	468	382	145,153	158,689	6,750	4,863	2,606	2,567

[1] New York City only.
[2] Typhus fever, week ended June 5, 1937, 38 cases, as follows: Illinois, 1; North Carolina, 1; Georgia, 14; Florida, 2; Alabama, 10; Texas, 10.
[3] Week ended earlier than Saturday.
[4] Rocky Mountain spotted fever, week ended June 5, 1937, 29 cases, as follows: Maryland, 2; Virginia, 1; Montana, 2; Idaho, 1; Wyoming, 14; Colorado, 1; Oregon, 7; California, 1.
[5] Under date of June 11 the State health officer of Texas, correcting previous reports, states that investigation of reported cases of poliomyelitis shows the occurrence of only 25 cases in Texas from Jan. 1 to May 29, 1937, instead of a total of 47 cases as shown by the weekly reports.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1937										
Massachusetts	29	11	-------	-------	2,984	1	0	1,175	0	4
Tennessee	26	34	475	32	131	27	2	117	0	14
May 193										
Arkansas	1	13	168	191	81	66	2	50	13	6
Connecticut	-------	15	5	-------	1,088	-------	0	633	0	1
Delaware	-------	-------	-------	-------	123	-------	0	17	0	3
Iowa	-------	16	11	-------	21	-------	0	695	128	2
North Carolina	22	49	48	1	1,104	65	3	130	0	14

Summary of monthly reports from States—Continued

April 1937

	Cases
Massachusetts:	
Anthrax	2
Chickenpox	1, 493
German measles	157
Hookworm disease	2
Lead poisoning	3
Mumps	785
Ophthalmia neonatorum	121
Paratyphoid fever	34
Rabies in animals	20
Septic sore throat	22
Tetanus	3
Trachoma	2
Trichinosis	2
Undulant fever	3
Whooping cough	1, 421
Tennessee:	
Chickenpox	143
Dysentery (amoebic)	1
Dysentery (bacillary)	5
German measles	61
Impetigo contagiosa	3
Mumps	139
Ophthalmia neonatorum	2
Puerperal septicemia	1
Septic sore throat	6
Tetanus	2
Tularaemia	3
Undulant fever	2
Vincent's infection	1
Whooping cough	247

May 1937

	Cases
Chickenpox:	
Arkansas	76
Connecticut	917
Delaware	73
Iowa	173
North Carolina	418
Conjunctivitis, infectious:	
Connecticut	7
Dysentery:	
Arkansas (amoebic)	13
Arkansas (bacillary)	1
Connecticut (bacillary)	1
Iowa (bacillary)	1
Encephalitis, epidemic or lethargic:	
Arkansas	2
German measles:	
Connecticut	68
Delaware	12
Iowa	10
North Carolina	690
Hookworm disease:	
Arkansas	2
Mumps:	
Arkansas	47
Connecticut	489
Delaware	48
Iowa	74
Ophthalmia neonatorum:	
Arkansas	1
Connecticut	1
North Carolina	1

May 1937—Continued

	Cases
Paratyphoid fever:	
Connecticut	4
North Carolina	1
Rabies in animals:	
Connecticut	8
Delaware	5
Septic sore throat:	
Arkansas	90
Connecticut	17
Iowa	1
North Carolina	8
Trichinosis:	
Connecticut	1
Tularemia:	
Arkansas	3
North Carolina	1
Typhus fever:	
North Carolina	1
Undulant fever:	
Arkansas	5
Connecticut	9
Iowa	17
North Carolina	2
Whooping cough:	
Arkansas	66
Connecticut	198
Delaware	45
Iowa	153
North Carolina	705

WEEKLY REPORTS FROM CITIES

City reports for week ended May 29, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	195	109	36	6, 337	576	2, 050	17	423	35	1, 401	-------
Current week[1]	137	56	33	4, 217	547	2, 343	25	403	21	1, 390	-------
Maine:											
Portland	0	1	0	1	5	2	0	0	0	0	22
New Hampshire:											
Concord	0	------	0	1	1	1	0	0	0	0	6
Manchester	0	------	0	1	5	3	0	0	0	0	-------
Nashua	0	------	-------	0	-------	1	0	-------	0	1	10
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	1
Burlington	0	------	0	1	0	1	0	0	0	0	5
Rutland	0	------	0	0	0	1	0	0	0	0	4
Massachusetts:											
Boston	6	------	1	68	11	53	0	9	0	58	235
Fall River	0	------	0	69	0	1	0	0	0	0	29
Springfield	0	------	0	2	1	7	0	3	0	10	34
Worcester	0	------	0	18	3	3	0	1	0	20	48
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	15
Providence	0	------	1	57	4	49	0	1	0	34	46
Connecticut:											
Bridgeport	0	------	0	1	0	71	0	1	0	1	29
Hartford	-------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------
New Haven	0	------	0	4	3	4	0	0	0	1	47
New York:											
Buffalo	0	------	0	97	12	16	0	6	0	17	120
New York	27	7	5	798	115	326	0	79	3	78	1, 578
Rochester	0	------	0	4	2	6	0	1	0	9	60
Syracuse	0	------	0	27	4	29	0	1	0	18	57

[1] Figures for Hartford, Fort Wayne, and Boise estimated; reports not received.

City reports for week ended May 29, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Jersey:											
Camden	0	2	1	27	0	8	0	1	0	0	26
Newark	0		0	75	13	16	0	9	0	9	107
Trenton	0		0	13	1	19	0	3	0	3	37
Pennsylvania:											
Philadelphia	4		0	40	32	243	0	18	1	33	501
Pittsburgh	3		4	232	15	46	0	10	0	37	181
Reading	0		0	219	2	15	0	1	0	7	28
Scranton	1			0		16	0		0	1	
Ohio:											
Cincinnati	3	1	1	116	7	25	0	6	0	25	135
Cleveland	2	4	1	597	24	96	0	20	2	45	208
Columbus	1	1	1	17	8	7	0	5	0	42	105
Toledo	1		0	439	5	7	0	5	0	48	70
Indiana:											
Anderson	0		0	30	4	9	1	0	0	2	8
Fort Wayne											
Indianapolis	1		2	387	10	19	0	0	0	26	125
South Bend	0		0	0	3	3	0	0	0	0	15
Terre Haute	1		0	0	0	0	0	0	0	0	20
Illinois:											
Alton	0		0	1	0	5	0	0	0	0	5
Chicago	19	3	1	224	31	272	0	35	0	60	691
Elgin	0		0	0	0	0	0	0	0	7	14
Moline	0		0	0	2	2	0	0	0	6	7
Springfield	0	1	0	9	3	5	0	2	0	3	23
Michigan:											
Detroit	10	1	1	81	24	366	0	18	3	56	266
Flint	1		0	0	5	26	0	0	0	4	26
Grand Rapids	1		2	48	2	11	0	1	0	26	36
Wisconsin:											
Kenosha	0		0	1	0	1	0	0	2	0	6
Madison	0		0	0	0	4	0	0	0	5	16
Milwaukee	0		0	15	4	87	0	7	0	29	104
Racine	0		0	0	0	26	0	0	0	1	12
Superior	0		0	0	0	3	0	0	0	4	12
Minnesota:											
Duluth	0		0	1	0	19	0	0	0	1	24
Minneapolis	0		2	4	4	26	0	2	0	29	98
St. Paul	0		0	0	5	4	0	2	0	78	70
Iowa:											
Cedar Rapids	0			1		6	0		0	1	
Davenport	0			0		3	0		0	0	
Des Moines	0			0		21	0		0	2	36
Sioux City	0			0		8	2		0	1	
Waterloo	4			0		41	1		0	6	
Missouri:											
Kansas City	1		0	1	10	41	1	9	0	13	97
St. Joseph	1		0	0	4	7	[1]5	1	0	0	30
St. Louis	5		0	39	5	150	1	18	0	49	210
North Dakota:											
Fargo	0		0	0	2	3	0	0	0	1	7
Grand Forks	0			0		0	0		0	8	
Minot	0		0	0	0	0	0	0	1	0	7
South Dakota:											
Aberdeen	0			0		0	0		0	0	
Sioux Falls	0		0	0	0	0	0	0	0	0	4
Nebraska:											
Omaha	1		0	2	4	2	0	2	0	9	46
Kansas:											
Lawrence	0		0	0	0	1	0	1	0	0	4
Topeka	0		1	0	3	1	0	0	0	7	28
Wichita	0		0	22	0	2	0	0	0	9	18
Delaware:											
Wilmington	0		0	2	3	0	0	2	1	1	33
Maryland:											
Baltimore	2	2	0	204	16	23	0	10	0	59	232
Cumberland	0		0	0	0	0	0	0	0	7	9
Frederick	0		0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	5	1	1	146	12	12	0	15	0	15	143

[1] 1 death from smallpox was reported at St. Joseph, Mo.

City reports for week ended May 29, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Virginia:											
Lynchburg	4	------	0	9	3	0	0	1	0	8	17
Norfolk	0	------	0	7	1	1	0	2	0	0	32
Richmond	0	------	0	1	3	2	0	3	0	0	62
Roanoke	0	------	0	107	2	0	0	0	0	5	13
West Virginia:											
Charleston	0	------	0	0	4	2	0	2	0	0	24
Huntington	1	------	------	0	------	2	0	------	0	0	------
Wheeling	0	------	0	2	3	2	0	1	0	1	23
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	4	------
Raleigh	1	------	0	5	2	0	0	1	0	0	22
Wilmington	0	------	0	1	0	0	0	0	0	2	11
Winston-Salem	0	------	0	0	0	5	0	1	0	7	12
South Carolina:											
Charleston	0	4	0	0	4	1	0	1	0	0	25
Florence	0	------	0	0	2	0	0	0	0	0	21
Greenville	0	------	0	0	0	0	0	0	0	0	4
Georgia:											
Atlanta	1	2	1	0	7	4	0	2	0	19	81
Brunswick	0	------	0	0	0	0	0	0	0	0	2
Savannah	0	4	0	1	4	0	0	2	1	12	31
Florida:											
Miami	0	1	0	1	0	3	0	6	0	1	34
Tampa	1	------	0	7	0	0	0	0	0	9	30
Kentucky:											
Ashland	1	------	1	162	1	0	0	0	0	1	34
Covington	0	------	0	13	1	1	0	1	0	4	14
Lexington	0	------	0	18	2	2	0	2	0	15	------
Louisville	0	------	0	57	4	27	0	2	0	85	62
Tennessee:											
Knoxville	0	------	0	0	3	0	0	1	0	0	21
Memphis	1	------	0	57	4	2	0	7	0	50	72
Nashville	0	------	1	11	2	0	0	2	0	9	51
Alabama:											
Birmingham	2	2	1	23	5	1	0	4	2	5	74
Mobile	0	------	0	0	1	0	0	1	0	0	26
Montogomery	1	1	------	0	------	0	0	------	0	2	------
Arkansas:											
Fort Smith	0	------	------	1	------	0	0	------	0	0	------
Little Rock	0	------	1	0	0	4	0	6	0	0	------
Louisiana:											
Lake Charles	0	------	0	1	1	0	0	2	0	0	7
New Orleans	6	------	0	5	18	9	0	12	5	4	156
Shreveport	0	------	0	0	7	1	0	3	1	0	41
Oklahoma:											
Muskogee	0	------	------	2	------	0	0	------	0	0	------
Oklahoma City	1	------	0	0	4	3	0	0	0	0	35
Tulsa	0	------	------	10	------	2	0	------	0	14	------
Texas:											
Dallas	3	2	2	89	2	17	0	1	0	24	57
Fort Worth	0	------	0	12	0	3	0	6	1	22	34
Galveston	2	------	0	0	5	1	0	0	0	0	21
Houston	4	------	0	0	8	0	0	8	0	0	73
San Antonio	0	------	1	4	5	1	0	4	0	2	74
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	8
Great Falls	0	------	0	0	2	0	2	0	0	9	12
Helena	0	------	0	0	0	4	0	0	0	3	3
Missoula	0	------	0	0	0	0	7	0	0	0	11
Idaho:											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado:											
Colorado Springs	1	------	0	1	1	2	0	3	0	1	12
Denver	1	------	0	10	5	22	4	4	0	29	78
Pueblo	0	------	0	0	1	0	1	0	0	0	5
New Mexico:											
Albuquerque	0	------	0	11	1	1	0	6	0	0	10
Utah:											
Salt Lake City	0	------	0	38	0	10	0	1	0	10	44

City reports for week ended May 29, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Washington:											
Seattle	3	------	0	5	2	6	0	9	0	39	87
Spokane	0	------	0	25	4	14	3	0	0	13	28
Tacoma	0	------	0	0	2	6	0	0	0	1	32
Oregon:											
Portland	0	------	2	2	9	18	0	2	0	2	86
Salem	0	------	------	0	------	2	0	------	1	0	------
California:											
Los Angeles	11	15	1	34	15	45	1	22	0	136	263
Sacramento	0	------	0	27	1	0	0	0	0	12	24
San Francisco	2	2	0	17	8	22	0	4	0	33	139

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	2	0	0
New York:			
Buffalo	1	0	0
New York	2	1	0
New Jersey:			
Newark	1	0	0
Pennsylvania:			
Philadelphia	2	1	0
Pittsburgh	0	1	0
Ohio:			
Cincinnati	3	0	0
Columbus	0	0	1
Toledo	1	1	0
Illinois:			
Chicago	1	0	0
Michigan:			
Detroit	2	1	0
Missouri:			
St. Joseph	0	1	0
St. Louis	0	0	1
Maryland:			
Baltimore	4	0	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
West Virginia:			
Huntington	1	0	0
Wheeling	0	1	0
North Carolina:			
Wilmington	1	0	0
Alabama:			
Birmingham	8	1	0
Mobile	0	1	0
Louisiana:			
New Orleans	1	0	0
Texas:			
Fort Worth	0	0	1
Houston	4	0	0
San Antonio	0	0	1
Montana:			
Missoula	0	1	0
Colorado:			
Denver	1	1	0
California:			
Los Angeles	2	3	3
Sacramento	1	0	0

Encephalitis, epidemic or lethargic.—Cases: New York, 4; Philadelphia, 1.

Pellagra.—Cases: Boston, 1; Winston-Salem, 2; Charleston, S. C., 1; Savannah, 4; Knoxville, 1; Los Angeles, 1.

Smallpox.—Deaths: St. Joseph, 1.

Typhus fever.—Cases: Wilmington, N. C., 1; Atlanta, 1; Savannah, 1; Birmingham, 1; Fort Worth, 2; Houston, 2; Los Angeles, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 22, 1937.—During the 2 weeks ended May 22, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	1			4	3					8
Chicken pox		2	2	250	596	17	65	24	114	1,070
Diphtheria		1	1	37	17	3		1		60
Dysentery					1					1
Erysipelas				10	8	2	4	2	4	30
Influenza	6	11		26	13	21	9		9	95
Measles	36	98	6	801	1,233	353	146	137	623	3,433
Mumps		2	21		414	9	11	45	66	568
Paratyphoid fever		1								1
Pneumonia	12	1			36		12		15	76
Poliomyelitis					2					2
Scarlet fever		10	5	169	221	46	41	156	55	703
Trachoma							4			4
Tuberculosis	15	40	43	145	65	18	18	2	30	376
Typhoid fever	1		4	31	1		3		4	44
Undulant fever					8		2	1		11
Whooping cough		1	1	255	153	82	33	2	12	539

CZECHOSLOVAKIA

Communicable diseases—March 1937.—During the month of March 1937, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	5		Paratyphoid fever	15	1
Cerebrospinal meningitis	33	6	Poliomyelitis	2	1
Chicken pox	160	1	Puerperal fever	34	11
Diphtheria	1,802	116	Scarlet fever	1,762	38
Dysentery	153	1	Trachoma	83	
Influenza	982	30	Tularaemia	48	
Lethargic encephalitis	3	3	Typhoid fever	310	29
Malaria	53		Typhus fever	35	1

DENMARK

Notifiable diseases—January–March 1937.—During the months of January, February, and March 1937, cases of certain notifiable diseases were reported in Denmark as follows:

Disease	January	February	March	Disease	January	February	March
Cerebrospinal meningitis	6	6	6	Poliomyelitis	1	2	4
Chicken pox	39	13	44	Puerperal fever	12	15	11
Diphtheria and croup	149	153	121	Scabies	1,235	901	1,076
Epidemic encephalitis	4	2	7	Scarlet fever	595	570	560
Erysipelas	217	214	217	Syphilis	58	55	70
German measles	6	58	72	Tetanus, neonatorum	4		3
Gonorrhea	844	709	713	Tetanus, traumatic	1		1
Influenza	52,063	11,134	7,597	Typhoid fever	8	8	1
Malaria	9	5	6				
Measles	87	60	68	Undulant fever (Bact. abort. Bang)	39	46	50
Mumps	1,196	1,377	1,608	Weil's disease			4
Paradysentery	13	14	16	Whooping cough	1,576	1,327	1,382
Paratyphoid fever	19	14	8				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 28, 1937, pp. 709–722. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 25, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

On steamship Ellenga.—According to information dated June 3, 1937, six deaths from cholera were reported on the steamship *Ellenga* arriving at Penang from the port of Negapatam on June 2, 1937.

Plague

Ceylon—Chilaw District.—On May 26, 1937, 1 case of plague was reported in Chilaw District, Ceylon.

Peru.—During the month of April 1937, plague was reported in Peru as follows: Department of Huancabamba, 3 cases; Lambayeque Department, 1 case; Libertad Department, 4 cases, 3 deaths; Lima Department, 1 case, 1 death.

Syria—Ras el Ain Region.—On May 31, 1937, 12 fatal cases of pneumonic plague were reported in Ras el Ain Region, Syria.

Typhus Fever

Morocco—Casablanca.—According to information dated June 3, 1937, typhus fever has appeared in Casablanca, Morocco, and adjacent regions principally among the natives where at least 200 cases and some deaths have been reported. Preventive measures have been taken.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Matto Grosso State—Corumba, May 2, 1937, 1 death (first appearance); Dourados, April 29, 1 death (first appearance); Maracaju, March 27, 1937, 1 case; Tres Lagoas, May 1, 1 death; Minas Geraes State—Bom Successo, April 22, 1 death.

Gold Coast.—Yellow fever has been reported in Gold Coast as follows: On May 26, 1937, 1 fatal case at Apesi, and 1 fatal case at Nugo.

Yellow Fever (Jungle Type)

Peru.—An outbreak of undetermined fever was reported in the Perené (Pampa Whaley) region of Peru, with 5 deaths occurring in 2 days and 5 other cases reported on April 7, 1937, and 23 cases with 8 deaths reported on April 11.

On April 19, Dr. Henry Hanson, traveling representative of the Pan American Sanitary Bureau, reported after investigation that, in his opinion, the disease was the jungle type of yellow fever. He stated that this opinion was concurred in by an official of the Rockefeller Foundation. Dr. Hanson's report stated that he had not found either *Anopheles* or *Aëdes* (*Stegomyia*) mosquitoes in the region of the outbreak; but that he had caught *Culex*, and that *Simulium* were abundant and would bite both in the sunlight and in the shade. Later Dr. Hanson found breeding places of *Anopheles* and collected larvae and pupae which, because of their small size, he suspected to be a new species. He also later found larvae which he thought to be *Aëdes aegypti*, although this was not definitely determined.

On June 12, the Assistant to the Director of the Pan American Sanitary Bureau, Dr. B. J. Lloyd, cabled the Director of Health of Peru, asking whether the disease in the Perené region should be regarded as positive or suspicious of yellow fever. His reply stated that the disease was "jungle fever." This is interpreted by Dr. Lloyd to mean the jungle type of yellow fever.

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DIVISION OF SANITARY REPORTS AND STATISTICS

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PUBLIC HEALTH REPORTS

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PURIFICATION AND PRECIPITATION OF THE ERYTHROGENIC FACTOR OF SCARLET FEVER STREPTOCOCCUS TOXIN AND ITS ANTIGENIC VALUE

By M. V. Veldee, *Surgeon, United States Public Health Service, National Institute of Health*

The purpose of this report is to present a method of purifying and precipitating the erythrogenic toxin of the hemolytic streptococcus for use in active immunization against scarlet fever. Such a modification greatly reduces the amount of nitrogen-containing compounds present in the immunizing material either as constituents of the broth or as bacterial proteins elaborated by the growing bacteria, apart from the erythrogenic toxin itself. At the same time, the method prepares the toxin in an insoluble form which gives it the antigenic advantage of slower absorption when injected for purposes of producing active immunity. Clinical data are also presented which indicate that such a preparation is tolerated in larger doses than is the case with the unpurified soluble toxin, and that a small total dose is required to bring about a negative Dick test in a satisfactory percentage of the susceptible individuals treated.

Ando, Kurauchi, and Nishimura (*1*) showed that the crude hemolytic streptococcus broth filtrate contained two substances capable of invoking skin reactions: (*a*) A substance which is alcohol-insoluble and relatively heat-labile, and (*b*) a substance which is both alcohol and acetic acid insoluble and which is heat-stabile. From clinical data which these authors (and also Toyoda and Futagi (*2*)) present, they conclude that the acetic acid insoluble fraction is identical with the nucleoprotein obtained by extraction of the washed bacteria themselves, and that the skin reaction resulting from the injection of this fraction is a manifestation of sensitization to this bacterial protein without relation to susceptibility to scarlet fever. Conversely, they conclude that the alcohol insoluble fraction contains the true erythrogenic toxin of scarlet fever and skin reactions produced by injections of this fraction indicate susceptibility to scarlet fever, this latter substance being the essential fraction contained in the Dick test toxin.

Green (*3*) modified somewhat the above method of collecting the alcohol-insoluble fraction so as to obtain a higher yield of the essential

toxin. He found this fraction "completely inactivated by heating for 30 minutes at 100° C.", and that boiling for 3 hours was required to destroy the acid insoluble fraction in the dilutions used. This investigator also concludes that the alcohol-insoluble fraction represents the true erythrogenic toxin of scarlet fever, and that the acid-insoluble fraction "appeared to be identical with a similar acid-insoluble fraction derived from an alkaline extract of washed bacterial bodies."

The findings to which reference has just been made have been confirmed by a parallel study carried out by the writer of this report. These two fractions invariably are present in the crude toxin. The alcohol-insoluble, heat-labile fraction invokes the Dick test reaction of susceptibility to scarlet fever, combines readily with antitoxin, and produces the symptoms of scarlet fever (except the sore throat) when injected in a sufficiently large dose in a Dick-positive child. On the other hand, the acid-insoluble, heat-stabile fraction invokes skin reactions more frequently in adults (where scarlet fever susceptibility is less common), possesses no combining power with antitoxin, and produces both local and constitutional reactions (but which are not typical of scarlet fever) when injected in sufficiently large doses, particularly in an adult.

The coexistence of these two fractions in the crude toxin should cause no surprise in view of our more extensive knowledge of the reactions induced by diphtheria toxin where an exactly parallel situation appears to exist. Susceptibility to the true toxin in either disease occurs when the titer of circulating antitoxin falls sufficiently low, whereas reaction to the heat-stabile bacterial protein is dependent upon sensitization to this protein brought about by actual contact with specific protein. Hence, we find that disease susceptibility (as measured by the Dick or Schick tests) decreases with age and extent of exposure, whereas sensitivity to the nucleoprotein increases with age and extent of exposure. Not infrequently reaction to both factors exists in the same individual. How often and to what degree this hemolytic streptococcus allergic state exists in the general population is shown by Myers, Keefer, and Oppel (*4*), Menten, King, Briant, and Graham (*5*), Derrick and Fulton (*6*), Gibson and McGibbon (*7*), Lyttle, Seegal, and Jost (*8*), Zingher (*9*), and Ando, Kurauchi, and Nishimura (*1*).

METHODS

Purification of the erythrogenic toxin.—The Dochez NY–5 strain of hemolytic streptococcus has been used in this study because of its uniformly high toxin production and also because of its good antigenic properties as indicated by the results obtained in preparing antitoxin for therapeutic use. However, a considerable number of other strains

have been studied, and the method has been found equally applicable irrespective of the disease of origin of the particular strain. In principle, the method to be described is the same as that used by Ando, Kurauchi, and Nishimura (*1*) and the modification devised by Green (*3*). Certain changes have been made by the writer which seem to simplify the method and improve the yield.

A toxin of high potency is desirable. This may be obtained by culturing the hemolytic streptococcus in three-quarter strength Douglas tryptic digest broth with an initial pH of 7.4 and a meat base of either veal or human placenta. After the broth is sterilized, 0.75 percent of dextrose (in the form of a sterile 50-percent solution) and 0.3 percent of a 0.25-percent alcoholic solution of phenol red are added. The completed medium is now incubated for sterility, and at the proper time the warm broth is inoculated with a young, rapidly growing culture and incubated at 37° C. until growth ceases. Growth is prolonged by carefully maintaining a pH of 7.0–7.2 through the addition of 15 percent NaOH solution as frequently as the color change of the phenol red indicates a pH of 7.0 or lower. (The addition of the alkali is facilitated by providing the culture flask with a two-hole stopper, one hole being fitted with a bent, cotton-stoppered vent tube and the other with a straight glass tube through which the alkali may be added. This latter tube is protected with an inverted small test tube, and the entire top of the flask is protected with a paper cone.) The culture flask should be vigorously rotated while the alkali is being added in order to insure rapid mixing. During the period of greatest growth the pH may need to be adjusted as often as every 10 to 15 minutes. When growth has ceased, the culture is tested for purity, the toxin broth is filtered free from bacteria, 0.4 percent phenol is added, the pH is adjusted to 7.0 and, finally, the toxin is stored at 0–5° C. for aging before titrating its potency. This method should produce a toxin having a potency of approximately 150,000 STD per cc, provided a suitable strain is used.

The purification of the toxin is accomplished as follows: To 3.5 volumes of 95 percent ethyl alcohol, cooled to 0° C. or lower, add 1 volume of toxin which has been cooled to 0–5° C., shake immediately and vigorously for about 1 minute, and then quickly collect the precipitate by centrifugation. Redissolve the moist precipitate in not more than one-fourth volume of normal saline and add 2 percent of glacial acetic acid. Mix and store at 0–5° C. overnight. Remove and discard the precipitate (nucleoprotein-containing fraction) by centrifugation. Dilute the supernatant liquid to one-half volume with buffered, phenolized saline as is recommended by the Scarlet Fever Committee for the dilution of the test toxin (1 part of phosphate buffer, pH 7.0, 9 parts of 0.85 percent NaCl, and 0.4 percent phenol). Finally, filter through a Berkefeld candle and store at 0–5° C. If this

purified toxin is to be used soon for the preparation of precipitated toxin as described below, the pH need not be adjusted at this stage. However, if the toxin is to be kept for any length of time, it is advisable to adjust the pH to 7.0 during the process of bringing up to the one-half volume.

Should a toxin of greater purity be desired, the alcohol and acetic acid precipitation step may be repeated. A purification involving two alcohol and one acetic acid precipitation will retain about 60 percent of its original potency, with the elimination of approximately 90 percent of the total nitrogen as is indicated in the following table:

Designation of toxin	Total nitrogen per 100 cc		Percent of total nitrogen removed
	Raw toxin	Purified toxin	
HL-43	206.7	28.4	86.3
179	150.4	11.2	92.6
337-H-14	167.9	10.8	93.8
337-H-14	167.9	8.2	95.1
028251	330.3	37.7	88.6
42646	198.0	13.9	93.0

The preparation of precipitated erythrogenic toxin.—Potassium alum does not precipitate the toxin. Trials with various protein precipitants disclosed the fact that tannic acid forms a stabile, insoluble, and noncorrosive compound with the toxin. For this purpose a 0.5 percent concentration of tannic acid in the toxin of pH 6.0 or less precipitates essentially 100 percent of the erythrogenic toxin and only about 40 percent of the total nitrogen contained in the crude toxin. With purified toxin 0.5 percent tannic acid precipitates all of the total nitrogen. The precipitate forms as large, whitish-gray floccules which slowly settle out. This precipitate is apparently inert from the standpoint of producing tissue necrosis. One cc of a fourfold concentration of the precipitated toxin when injected subcutaneously into the abdominal wall of guinea pigs produced a well localized induration which persisted for nearly 3 weeks, but at no time was there any evidence of tissue destruction. Up to the present time over 4,000 children have received either subcutaneous or intradermal immunizing doses of precipitated antigen without any evidence of local abscess formation.

Such a washed precipitate remains as a loose flocculent mass when resuspended in its original volume and kept at 0–5° C., but when stored at room temperature, or when it was shipped across the continent, and return, in summer, it contracted into a firm, dark-colored mass which could not be resuspended by shaking. However, it was found that the addition of a colloid would prevent such clumping. Acacia has been used for this purpose, since neither its presence in the immunizing

toxin suspension interferes with the antigenic value nor does the small amount used possess any objectionable features for parenteral use in the human.

The various steps in preparing this precipitated toxin are as follows: Dilute one volume of toxin, previously cooled to 0–5° C., with three volumes of cool, phenolized buffered saline solution of pH 6.0 (9 parts 0.85 percent saline, one part phosphate buffer pH 6.0, and 0.4 percent phenol), and add slowly to this diluted toxin 0.5 percent tannic acid (0.5 percent of the original volume of toxin) which has previously been dissolved in one volume of buffered saline. Shake vigorously during the mixing process and for a short time thereafter. Allow to stand at 0–5° C. until the precipitate has settled out, usually overnight. Draw off the supernatant liquid and replace with an equal volume of fresh buffered saline. Mix thoroughly and again allow the precipitate to settle out. The washing is repeated until all color of the original toxin has disappeared and the filtered wash water no longer gives a test for tannic acid with ferric chloride test solution. Usually three washings suffice.

Finally, all possible supernatant liquid is drawn off, sufficient 10 percent acacia solution is added to give a 1-percent concentration in the final volume, and enough buffered saline is added to bring up to the original volume. It is needless to add that the sterility of the toxin must be preserved throughout the entire process. This now represents the purified and precipitated toxin from which further dilutions are made for immunization purposes.

Preparation of the individual immunizing doses.—The dilution of this stock suspension of purified and precipitated toxin into suitable immunizing doses depends upon the potency of the stock suspension, the desired final dose, and its volume. The dilution formula is as follows:

A. Stock suspension of toxin.
B. Sterile acacia solution (10 percent) enough to give a 1-percent solution.
C. Sterile saline-phosphate buffer solution of pH 7.0 (the formula is given above under toxin purification).

As a result of the trial immunizations which are to be described later, the intradermal method of injecting the antigen seems preferable, and in 3 doses of 750, 3,000, and 10,000 skin-test doses, respectively. The volume of each intradermal dose is 0.1 cc, and therefore the stock suspension is diluted by the above formula into 3 doses of 7,500, 30,000 and 100,000 skin-test doses per cubic centimeter, respectively. From this it will be seen that the stock suspension must contain at least 100,000 STD per cubic centimeter. An interval of 2 weeks is allowed between injections. There is some evidence to indicate that a longer interval will produce a higher percent of immunes.

The preferred site for making the intradermal injection is on the outer surface of the lower half of the upper arm.

Active immunization with purified and precipitated toxin.—Intramuscular, subcutaneous, and intradermal injections were made in different groups of children in order to determine the method of preference with regard to (*a*) local and constitutional reactions, and (*b*) the immunity response as measured by the Dick test at some later date.

It soon became evident that the child very definitely showed a preference for the intradermal method. In the child's mind, immunization by this method merely means another skin test. (There is available a 26-gage needle, three-sixteenths of an inch in length and with one side of the hub beveled so that the needle shaft will be flat on the skin.) Intradermal injections can be made quickly, with little preparation and equipment, and it is easy to maintain aseptic technique. Intramuscular injections invariably cause muscle soreness of some degree. The intradermal injection causes a clearly circumscribed area of induration which lies superficially without involvement of the muscle. This eliminates muscle soreness on motion, a very important factor in the active child. There may be localized tenderness on palpation. An occasional child, usually an older one, may develop more extensive local swelling. There is a wide individual variation in the maximum dose which is tolerated without significant reaction, irrespective of the route selected for making the injection, and there is also a rather constant age factor, reactions increasing with age. The underlying cause for these differences in tolerance is not clear, but it is the writer's opinion that previous sensitization to the specific bacterial protein plays a very great role both in individual and age variations.

Trial doses which have involved injections in a total of 3,208 persons (nearly all of grammar-school age) have been given in a study to determine the practicability of this purified and precipitated toxin. An initial intradermal dose of 750 skin-test doses and a second dose of 3,000 skin-test doses causes essentially no significant reaction. A third dose of 10,000 skin-test doses in a group of 871 caused vomiting in less than 5 percent. This vomiting was rather peculiar in that it so frequently occurred within a few hours of the injection and was so quickly followed by complete relief. Other constitutional symptoms were insignificant in the 871 children. Local reactions following either of the three injections were not important.

The same doses given as subcutaneous or intramuscular injections may be expected to cause constitutional reactions more frequently and always more local discomfort.

Another indication of the very little discomfort experienced by the child from three injections of 750, 3,000, and 10,000 skin-test doses, respectively, is that in a group of 1,203 grammar-school children,

scattered through 17 schools, only 5 (or 0.4 percent) refused to complete the course of treatment and the retest.

TABLE 1.—*Active immunization of Dick-positive children of grammar school age with subcutaneous or intramuscular injections of purified and precipitated scarlet fever streptococcus toxin*

Group	Total skin test doses of toxin injected	Results of retesting with standard control toxin [1]		
		Number retested	Negative	Percent negative
A	[2] 5,000	37	26	72.2
B	[3] 10,500	64	50	78.1
C	[3] 21,000	37	34	91.9
D	[3] 25,000	360	332	92.2

[1] Retests made 1 to 2 months after the last immunizing injection.
[2] Given in 2 graduated doses with a 2-week interval.
[3] Given in 3 graduated doses with 2-week intervals.

The immunity produced by the subcutaneous and intramuscular injections of the purified and precipitated toxin is shown in table 1. Group B received 500, 2,000, and 8,000 STD, respectively, as the three injections and without significant reaction. Group D received 1,000, 4,000, and 20,000 STD, respectively. However, local and constitutional reactions were too frequent with the latter dosage, even though the percentage of immunes is satisfactory.

Table 2 gives the immunity results following intradermal injections of two or three doses. It will be seen from the retest results that a satisfactory percentage of immunes may be obtained with either two or three intradermal injections. However, when the resultant reactions are considered, the larger doses given in the two-dose method are unsatisfactory because of the frequency of constitutional reactions (about 20 percent).

TABLE 2.—*Active immunization of Dick-positive persons with intradermal injection of purified and precipitated scarlet fever streptococcus toxin*

Group	Age range of persons treated	Total skin test doses of toxin injected [1]	Results of retest		
			Number	Negative	Percent negative
A	6-13 years	4,000-5,000	172	96	55.8
B	do	6,000-9,000	439	362	82.4
C	do	13,750-16,000	1,008	842	83.5
D	Preschool	8,000	19	17	
E	High-school students and pupil nurses	16,000-19,000	47	42	

[1] An interval of 2 weeks was allowed between doses in groups A, C, and E. The interval was 5 weeks in groups B and D. Groups A, B, and D received 2 doses; groups C and E, 3 doses. The volume of each injection was always 0.1 cc, and the injection was made on the outer surface and lower half of the upper arm.

The practice has been not to retest the treated children sooner than 1 month after the last immunizing injection. As a general rule, it may be said that the longer the interval between immunization

and the retest the more rigid the measure of the antigenic value of the method used.

Sera from three boys whose Dick reaction had been rendered negative by two intradermal injections were titrated against controls consisting of three sera from boys with "natural" Dick negative reactions. Each of the six neutralized more than 20 skin-test doses of standard toxin per cubic centimeter. Unfortunately, the titrations were not carried to an end point.

Insufficient time has elapsed to give great significance to any change in the incidence of scarlet fever within the age group studied. Nevertheless, the trend is very definitely to a grouping of the reported cases in that age group of the population not included in the study group (namely, the first six grades of grammar school). For example, based on a 6-year average, 55.8 percent of all the cases reported occurred within the age range of 6 to 12 years, both inclusive, whereas since immunization started this percentage has fallen to 31.7 percent with no case occurring in a treated child. In one community having 300 children in the first six grades of grammar school, active immunization with two doses was started in the midst of an outbreak, which to date has totaled 32 cases. Six months have elapsed since the first injection, with no case in a treated child, as against 13 cases in persons neither tested nor treated. A detailed epidemiological report will be made at a later date covering the entire study group.

DISCUSSION

As a result of this study, which was begun in May 1935, there has been developed a practicable method of preparing the hemolytic streptococcus toxin in the form of a purified and insoluble antigen. The modification outlined in Appendix A greatly simplifies the earlier method used in the major portion of this study.

Using human placenta as the source of the essential broth proteins in place of veal or beef eliminates from the toxin foreign proteins to which some humans are sensitized. Inclusion of the acetic acid precipitation step removes most of the undesirable heat-stabile protein fraction without causing any appreciable reduction in the amount of erythrogenic toxin present. The insolubility of the finished product retards absorption and thereby lengthens the period of antigenic stimulation. The intradermal route of making the injections in itself retards absorption and also greatly reduces local pain and muscle soreness.

The injection of 3 intradermal doses of 750, 3,000, and 10,000 skin test doses, respectively, changed the Dick reaction from positive to negative in over 80 percent of the children treated. It was observed that the percentage becoming negative varied somewhat with the economic status of the family and with the incidence of endemic scarlet

fever in the community. There is also an age variation, younger children, on the average, being slightly more difficult to immunize.

The three injection-intradermal method was well received by both child and parent. In the present study 9,379 children were given consent slips; and of these, 6,005, or 64.03 percent, were returned with parental approval. Of the 6,005 children given the preliminary Dick test, 44.06 percent were positive; and of these, less than 0.5 percent refused to complete the course of three injections and a retest. The writer feels that some consideration must be given to the viewpoint of the child, parent, family physician, and health officer, and to the importance of the disease itself, in devising methods of active immunization. Experience has shown that the production of complete group immunity against any disease is impracticable. However, if in the case of scarlet fever it is desirable to produce more immunes than is accomplished by the three-injection method used in this study, it can readily be done by one of three methods: (*a*) By giving a fourth injection to those who give a positive reaction on retest; (*b*) by increasing the number of skin test doses in the third dose (in one group studied 95 percent tolerated a third dose of 12,000 STD without significant constitutional symptoms, and approximately 85 percent tolerated 20,000 STD); or (*c*) the routine administration of more than three doses to all Dick positive children. Of these three alternatives, the first would be preferred by both child and parent, and offers the least administrative inconvenience.

Because of the very high percentage of preschool and first-grade children who are Dick positive, and because of the occurrence of more than half of the reported scarlet fever in the 6 to 12 age group (both inclusive), the writer feels that active immunization should be restricted to the first-grade children and such younger children as can be reached. The preliminary Dick test can then be omitted. However, a retest should be made 1 to 6 months after the last immunizing dose.

ACKNOWLEDGMENTS

The writer wishes to express his gratitude to Drs. E. C. Peck and J. P. Franklin, and to the several members of the health departments over which they have supervision. Their intelligent and enthusiastic cooperation has made the clinical part of this study possible.

Appendix A

A MODIFIED BROTH FOR TOXIN PRODUCTION

From the beginning of the experimental work with purification of the toxin it was evident that the steps involved in the purification process were somewhat intricate, though not sufficient to render the procedure impracticable. However, simplification is always to be

desired; and with that in mind, further study has been given to this point in preparing the purified and precipitated toxin.

In an earlier report (*10*) the writer mentioned that the usual broth employed for streptococcus toxin production contained an amount of nitrogenous material far in excess of maximum growth requirements. In fact, one-quarter strength broth produced as much toxin as full strength.

Another factor to be considered is the character of the protein which remains in the antigenic material, aside from the protein of the toxin itself. If this is an homologous protein it may be expected to eliminate such reactions as would occur through the injection of heterologous proteins. Therefore, human placenta has been used as the base for the culture media. The placentas, with all attached membranes and blood, are quickly cooled and this material is used, weight for weight, in place of the beef, or veal, formerly used in making tryptic digest broth.

Full-strength Douglas tryptic digest human placenta broth is made by the usual formula, and from this the diluted broth is prepared as follows:

Full strength broth of pH 7.2	250 cc.
Sodium chloride	5 gm.
Phosphate buffer of pH 7.0	100 cc.
Distilled water	650 cc.

Bring the media to a boil and filter through paper. Distribute into culture flasks of the desired volume which have been fitted with stoppers, as previously described. Sterilize in the autoclave in the usual way. When cold, add 1 percent of sterile human serum, 0.75 percent dextrose (use a 50 percent sterile solution), and 0.3 percent of a 0.25 percent alcoholic solution of phenol red. These additions are made through the tube in the stopper, as already described. Incubate for sterility and culture for toxin production in the manner previously outlined. Growth proceeds somewhat slower in this diluted, buffered broth.

Purification and precipitation of this toxin is accomplished as described above, but with the following change: The alcohol precipitation step is omitted. Two percent of glacial acetic acid is added to the cool toxin (0–5° C.). As soon as the precipitate has formed, it is discarded by filtration through a Berkefeld or Seitz filter. Precipitation with 0.5 percent tannic acid is made at this point in the manner outlined above. There is essentially no loss in potency through acid precipitation alone, whereas with the inclusion of the alcohol step a considerable loss follows.

The following report represents the analysis of one such batch of purified and precipitated toxin:

A. Total nitrogen per 100 cc of crude toxin........................ 70.6 mg.
B. Total nitrogen per 100 cc acetic acid precipitated toxin............ 53.8 mg.
C. Total nitrogen per 100 cc acetic acid-tannic acid precipitated toxin... 27.6 mg.

The potency of either the crude toxin or the acetic acid-precipitated fraction was approximately 100,000 STD by direct skin reaction comparisons and the same by toxin-antitoxin neutralization tests.

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TYPHOID VACCINE: THE TECHNIQUE OF ITS PREPARATION AT THE ARMY MEDICAL SCHOOL

By Maj. Rufus L. Holt, *Medical Corps, U. S. Army, Chief, Division of Biologic Products, Army Medical School,* and Maj. Arthur P. Hitchens, *Medical Corps, U. S. Army, Chief, Division of Bacteriology and Epidemiology, Army Medical School*

The production of typhoid vaccine for use in the Army, and other Government services, was begun by Brig. Gen. Frederick F. Russell, O. R. C. (then captain, Medical Corps), in 1908, at the Army Medical School. The procedure adopted was a modification of the English and the German methods, the aim being to make a sterile, standardized suspension of typhoid bacilli with their essential immunogenic constituents as little changed as practicable.

While the technique of preparation originally adopted has been followed, with modifications, up to the present, this has not resulted from an unconsidered adherence to tradition. The organism used, when tested by means available at the time, was thought to possess two qualities which rendered it especially suitable for vaccine production, namely, low toxicity and high immunogenic potency. However fortuitous the adoption of the strain may have been, the results from its use since 1909 have amply justified its selection. The technical difficulties surrounding comparative studies have made it necessary to proceed with great caution in work which has had as its object the substitution of a superior strain.

During the few years prior to 1935, studies in various laboratories had revealed technical methods which held promise of yielding valuable information. Taking such developments into consideration,

systematic research was begun in October 1934, at the Army Medical School, upon the possibility of finding a strain of *Eberthella typhosa* whose immunizing potency might be even higher than that of the Rawlings strain and at least its equal in practical ways. Of the work planned, studies already completed have been published (*1*) and further reports will be made from time to time. As a result of 2 years' work, a strain has been found which gives evidence of being superior to the Rawlings and other strains tested, and a recommendation was made to the Surgeon General of the Army on October 10, 1936, that this new strain (No. 58) be substituted for the Rawlings strain in the routine preparation of the vaccine. The recommendation was approved October 12, 1936, since which time all antityphoid vaccine manufactured at the Army Medical School has been prepared from this strain.

THE BIOLOGICS PRODUCTION DIVISION, ARMY MEDICAL SCHOOL

General.—This Division occupies the first and basement floors of the entire northwest wing of the Army Medical School. Partitions isolate the work to as great an extent as though it were housed in a separate building. In its planning and construction, facility of cleaning and exclusion of sources of contamination were primary considerations. All culture and other technical procedures associated with the preparation of vaccine are conducted in cubicles constructed of monel metal and glass (5 in number). These are rooms built inside the large laboratory rooms and separated from the outside walls of the building. They consist of individual cubicles, one each for planting, harvesting, killing, mixing, and bottling the vaccine. Ducts bring conditioned, washed, filtered, and sterilized air to them, the sterilization being reinforced by a series of 16 ultra-violet lamps. In addition, there is a steam spray outlet at the center of the ceiling of each cubicle. Before the cubicle is used, it is flooded thoroughly with steam in order to carry down bacteria-laden particles that may be suspended in the air.

All sterilizers are provided with automatic pressure or temperature controls, or both, and recording thermometers. Incubators, in addition to temperature controls and recorders, are provided with air circulating and humidifying devices. These assure moist atmosphere and uniform temperature throughout.

THE PREPARATION SUBDIVISION

Glassware.—As glassware comes in at the receiving entrance it is sterilized by steam under pressure, by boiling, or by a combination of both methods. It is then washed, drained, and finally dried in a large oven drier designed for the purpose. The small ampules, vials, and bottles which are filled with the vaccine for distribution are washed

on a manifold water-jet device which permits the simultaneous rinsing of 150 of these small containers. After being thoroughly cleansed, the water remaining in them is blown out by compressed air. They are then placed in metal boxes and sterilized by hot air for 5 hours at 240° C. In these boxes they are taken to the filling cubicle and there receive their specified amounts of the finished vaccine.

Culture media.—Veal infusion, the basic ingredient of the culture media used in the preparation of the vaccine, is made as follows:

Lean veal (freed from fat and fibrous tissue)	10,000 gm.
Distilled water	10,000 cc.

Place in the refrigerator for 18 to 24 hours. Remove and bring slowly to the boiling point; continue boiling for 45 minutes; strain through cheesecloth and press out as much fluid as possible; bring the volume up to 10,000 cc by addition of distilled water; place in 2-liter flasks; autoclave at 15 pounds for 30 minutes; store in refrigerator. Stock infusion more than 21 days old is not used in the preparation of vaccine.

Veal infusion broth

Peptone	10 gm.
Sodium chloride	5 gm.
Agar (powder)	18 gm.
Veal infusion	1,000 cc.

Mix and heat to dissolve the agar; adjust the reaction to pH 7.4; fill into plugged and sterilized Kolle flasks (each flask receives 45 cc); autoclave at 15 pounds for 30 minutes; check pH (if it is not about pH 7.2 it is not used for vaccine production).

Upon removal from the autoclave, place the Kolle flasks on a level table to allow the agar to harden; incubate them for 24 hours to check their sterility; store at room temperature until they are to be inoculated. For convenience, the flasks are handled in metal trays each holding 50 flasks. In the parlance of the laboratory such a tray of 50 flasks is a unit designated as a "section".

A few hours before they are to be inoculated, the sections are placed in a preheating incubator (held at 45° C.) located just outside the inoculating cubicle. This is to insure their being near blood heat when they are planted, to eliminate the lag in growth which results from chilling.

Sterility broth.—This medium, recommended by the National Institute of Health, United States Public Health Service, for use in routine sterility tests, is prepared as follows:

"To 8 kilograms of ground fresh meat freed from fat, 16 liters of distilled water are added and the mixture is infused in the ice chest 24 hours. Sixteen liters of juice are squeezed out through cheesecloth, heated in streaming steam for 1 hour, autoclaved at 15 pounds pressure for 30 minutes, filtered through moistened paper, and brought up to

the original volume. Five grams of sodium chloride per liter and 10 grams of peptone per liter are added and the broth is stirred until solution takes place. The pH is adjusted to such a point as experience shows will result in a pH of 7.5 in the final broth in the fermentation tubes by adding solution of sodium hydroxide. The broth is heated in streaming steam for 30 minutes, filtered through moistened paper, placed in glass-capped Smith fermentation tubes, each containing at least 25 cc and holding a seal of at least 1 centimeter in the open arm, and autoclaved at 15 pounds pressure for 20 minutes. The Smith fermentation tubes should be in racks which facilitate tipping oxygen bubbles out of the long arm when hot, or which allow such bubbles to flow out of the tubes while the heating is going on, and which permit ready inspection of all parts of the tube for growth. The design in use at the National Institute of Health is recommended. If the broth is not to be used immediately, it may be filtered into flasks containing not more than 1,500 cc each, sterilized by streaming steam for 2 hours or by autoclaving for 20 minutes at 15 pounds pressure, and stored prior to filling into fermentation tubes.

"To detect contamination, the fermentation tubes may be incubated for a few days, or an adequate number (about 20 percent) of controls planted with material known to be sterile, simultaneously with the tests. Not more than 5 hours before planting, the fermentation tubes shall be heated to fully 100° C. for 30 minutes and immediately tipped to expel the air from the long arm unless the tubes are arranged in the sterilizer so that the bubbles leave each tube while being heated. The pH at this point should be between 7.2 and 7.8; but instead of repeated adjustments of reaction during the process of preparation of the medium, it is preferable to add enough alkali in the beginning to insure a proper reaction when all the steps are completed. The amount to be added can be ascertained only by repeated trials, using the same ingredients. No acid should be added at any point in the process.

"No dextrose need be added to the batch of medium provided a preliminary test has shown that it contains an appreciable amount of muscle sugar. This test is made by inoculating two Smith fermentation tubes, filled with the fully prepared and sterilized medium, with an active strain of colon bacillus. If, after overnight incubation, both fermentation tubes show a bubble of gas filling the tip of the closed arm, sufficient sugar may be assumed to be present. If not, or in the absence of such a test, approximately 0.03 percent of dextrose should be added just before the final heating in the fermentation tubes. For this purpose 1 percent dextrose solution in flasks containing not more than 50 cc each should be sterilized in the autoclave at 15 pounds pressure for 15 minutes, and added to the broth in the proportion of 1 cc to each fermentation tube. Planting is done within 5 hours after the broth has cooled."

Buffered saline solution.—This is the menstruum in which the agar growth of typhoid bacilli is suspended, 30 liters being provided for each "section" of 50 Kolle flasks. For convenience this is distributed into four 8-liter bottles, each containing 5 liters of the saline, and the remainder in 1-liter and 2-liter Erlenmeyer flasks.

The formula for the buffer solution is as follows:

NaH_2PO_4	28.81 gm.
Na_2HPO_4	125.00 gm.
Distilled water, q. s. ad	1,000.00 cc.

The buffer solution is added to the saline (which is 0.85 percent NaCl in distilled water) in the proportion of 20 cc of buffer to each liter of saline solution. The buffered saline solution is then sterilized at 15 pounds for 1 hour.

Mucin.—For the preparation of the mixture of crude hog stomach mucin in which the test doses of living typhoid bacilli are suspended, for injection intraperitoneally into mice, three sterile solutions are used at the present time:

1. To 75 gm of mucin, powdered by grinding in a ball mill, add 800 cc of distilled water, mix thoroughly and allow to stand in the refrigerator overnight (granular mucin requires 18 hours in the refrigerator). Remove and stir with a motor-driven mixer for 2 hours; make up the volume to 1,320 cc with distilled water; autoclave at 10 pounds for 15 minutes.

2.

K_2HPO_4	20.25 gm.
KH_2PO_4	4.32 gm.
Distilled water q. s. ad	165.00 cc.

Mix and autoclave at 15 pounds for 30 minutes.

3.

Dextrose C. P.	7.5 gm.
Distilled water q. s. ad	15.0 cc.

Sterilize by filtration or by heating at 80° C. for 1 hour on each of 3 successive days.

Mix these three solutions under sterile conditions, using flame technique. Check the reaction—it will be pH 7.2; test for sterility. Store the mixture in a refrigerator. Before a portion is withdrawn for use, agitate the mixture thoroughly until all sediment is uniformly in suspension.

In order to secure information concerning some of the essential qualities of a useful mucin mixture, estimations are made, on every lot, of viscosity and total and nonprotein nitrogen content. Furthermore, active studies are in progress which have as their aim a simplified process and a uniform product as well as the elucidation of the problem of the mode of action of the mucin.

Cotton swabs.—These are ordinary cotton swabs, of rather large size used for inoculating the agar in the Kolle flasks. They are made by applying absorbent cotton to the ends of iron wire rods, and are inserted into large test tubes and sterilized in the autoclave for 1 hour at 15 pounds pressure.

Collecting flasks.—These are heavy-walled Erlenmeyer flasks with a graduation mark indicating 2,000 cc. They are fitted with two-holed rubber stoppers. One of the openings in the stopper carries a glass tube 3½ inches long which, in operation, is attached by sterile rubber tubing to the vacuum system; the other opening is for a shorter glass

tube to be connected with the harvesting tool. This latter tube is flanged at its lower end and has attached to it a filter bag consisting of three layers of gauze. The collecting flasks, with their stoppers in place and covered with muslin, are autoclaved at 15 pounds for 30 minutes.

The harvester.—The harvester is a metal tube 13¼ inches long with a short section 1½ inches long fixed to its distal end to form a T. The transverse piece will pass into the Kolle flasks through the broad oval neck; it is closed at both ends and has a narrow opening or slot running nearly its entire length on one flattened side. The harvester serves as a rake to loosen the growth of bacteria from the surface of the agar, then the suspension thus formed is aspirated, through the slot, into the collecting flask. The harvesters, after being wrapped in muslin, are sterilized in the autoclave at 15 pounds for 30 minutes.

Cotton stoppers.—These are gauze-covered cotton plugs provided to replace the rubber stoppers in the 2-liter collecting flasks. They are wrapped in muslin and sterilized in the autoclave at 15 pounds for 30 minutes.

Graduated cylinders.—Graduated cylinders of 1,000 cc capacity are stoppered with gauze-covered cotton plugs, and, with muslin tied over their stoppers, they are sterilized in the autoclave at 15 pounds for 30 minutes.

Pipettes.—Pipettes of 10 and 25 cc capacity are sterilized by hot air at 170° C. for 2 hours.

The bottling apparatus.—This is assembled, wrapped, and sterilized in the autoclave at 15 pounds for 30 minutes.

The bottling cabinets.—The bottling cabinets are wrapped and sterilized in the autoclave at 15 pounds for 60 minutes.

Vaccine ampules and vials.—Vaccine ampules (1 cc) and vials (5, 10, 25, and 50 cc) are washed and dried, packed in trays, in metal boxes, and sterilized by hot air at 240° C. for 5 hours.

Rubber stoppers.—Rubber stoppers to fit the vaccine vials are of special composition. They are washed thoroughly in several changes of hot water, then autoclaved for 30 minutes at 15 pounds pressure. Then they are washed again, placed in 0.8 percent phenol solution, and again autoclaved while still immersed in the phenol solution at 15 pounds for 30 minutes. For use they are removed from the phenol solution in small quantities as needed to stopper the filled vaccine bottles.

Rubber gloves.—Rubber gloves are washed in 2 percent phenol and sterilized at 15 pounds pressure for 30 minutes.

Gowns and other clothing.—Gowns and other clothing worn exclusively by the technicians while working in the cubicles are sterilized in the autoclave at 15 pounds for 30 minutes. The sterile clothing is put on after the technicians have entered the cubicles.

Shoes.—Shoes are wet just before use by dipping their soles in a shallow pan containing a gauze pad wet with cresol solution.

Large earthenware jars.—Large earthenware jars containing 3 percent cresol solution are provided for the disposal of tubes and other materials contaminated by living bacteria.

The seed culture.—Since October 12, 1936, *Eberthella typhosa* 58 has been used in the preparation of the Army typhoid vaccine. This strain was isolated from the feces of a chronic carrier, in Panama, who had typhoid fever in 1913 and who, since that time, has been under the continuous observation of Dr. L. B. Bates, Director of the Board of Health Laboratory, Panama Canal. The culture was received in September 1934, immediately after isolation from the carrier.

The surface colonies of this strain, on plain agar plates, are relatively large, with a moderate dome which is somewhat flattened; edges are slightly undulate; surface is smooth; consistency is moist and homogeneous; the growth mixes evenly with saline; it does not agglutinate in 6.4 percent saline; it grows with uniform turbidity in broth without granular clumps; surface pellicle is absent in young cultures, and there is no sedimentation. The bacilli are actively motile, and are uniformly small, short rods. Studies of the bacterial count of finished vaccines seem to indicate that Strain 58 has more tendency to autolyze than does the Rawlings strain. When suspended in mucin their virulence is such, when inoculated intraperitoneally, that 10, 100, or 1,000 living bacilli will kill all white Swiss mice or black mice (Strain C–57) of 16 to 18 gm weight within 72 hours.

It is well known that many bacteria lose certain parasitic attributes after continuous cultivation on artificial culture media. In order to avoid such changes and to maintain the vaccine cultures without alteration or dissociation, large numbers of ampules containing the frozen and dried cultures are kept in stock. For this method of preservation the apparatus of Flosdorf and Mudd is used. This apparatus consists of a glass or metal manifold having 24 outlets with a main and secondary condenser connected in series, immersed in a bath of dry ice (solid CO_2) and an antifreeze solution, contained in an insulated vessel. The secondary condenser is connected with the vacuum pump.

Broth suspensions of the agar cultures, grown for 12 hours at 37.5° C., are distributed in small amounts, usually 0.2 cc, into ampules. The ampules are immersed in a dry-ice bath (temperature about −78° C.) for 10 to 15 minutes. At the end of this time the ampules are rapidly connected to the manifold and the vacuum pump is started. Moisture is removed from the frozen material by sublimation *in vacuo* and is trapped in the condensers. A vacuum of 0.70 mm Hg, or less, will keep the cultures frozen until drying is complete. This requires

about 6 hours. Then, with the vacuum pump still operating, the ampules are sealed off individually, using a gas-oxygen hand torch. The dried cultures are stored at 2° to 5° C.

When a lot of vaccine is to be manufactured, an ampule is broken, about 0.2 cc sterile distilled water is added, and a culture in veal infusion broth is made from the resultant suspension. After incubation for 2 hours, streak cultures are made on veal infusion agar in Petri dishes; a series of 10 plates is made; these cultures are grown in the incubator overnight. The following morning the colonies developed are studied with great care, using a binocular dissecting microscope. Typical smooth colonies are fished to agar slants in large (50 by 200 mm) test tubes; a part of the same colony is planted to a tube of Russell's double sugar agar, by streak and stab. These cultures are all incubated overnight. The growth on each of the large agar slants is the seed for the inoculation of one section of 50 Kolle flasks. The growth in these large culture tubes is suspended in 25 cc of veal infusion broth and the suspension transferred to clean sterile tubes of the same size. After incubation for 2 hours these tubes are ready to be taken to the cubicles and used for the inoculation of the agar in the Kolle flasks.

The few drops of suspension left in the culture tubes are studied to determine the purity and identity of the growth. Motility is checked in hanging drop, and staining reaction and morphology are ascertained on a gram-stained slide. A suspension showing any tendency to auto-agglutination is discarded; those in which there are long thread-like forms are not used, partly for the reason that the threads interfere with accuracy in counting.

The Russell double sugar cultures, which were made as duplicates from colonies used to inoculate the seed cultures, must show typical acid butt and alkaline slant, with no gas formation. The growth from these Russell slants is suspended in buffered saline and used to make agglutination tests. The result must be positive to the limit of potency of the agglutinating serum used. The tubes containing the appropriate mixtures of agglutinating serum and suspension are held at 56° C. for 2 hours and then placed in the refrigerator overnight.

THE PRODUCTION SUBDIVISION

Planting the Kolle flasks (fig. 1).—Before they are placed in the special incubator, where they are brought up to 45° C. preparatory to inoculation, the Kolle flasks are examined for cracks and other flaws, for imperfect cotton stoppers, and for any indication of contamination of the agar. Only flasks perfect for the purpose are transferred from the preparation subdivision to the production subdivision.

Two technicians work together in the planting cubicle. They wear only sterilized clothing and only they enter the cubicle. The cubicle

FIGURE 1.—Inoculating the Kolle flasks.

FIGURE 2.—Collecting the growth from the Kolle flasks.

FIGURE 3.—The pooling and mixing chamber. Steam hose connected for sterilization.

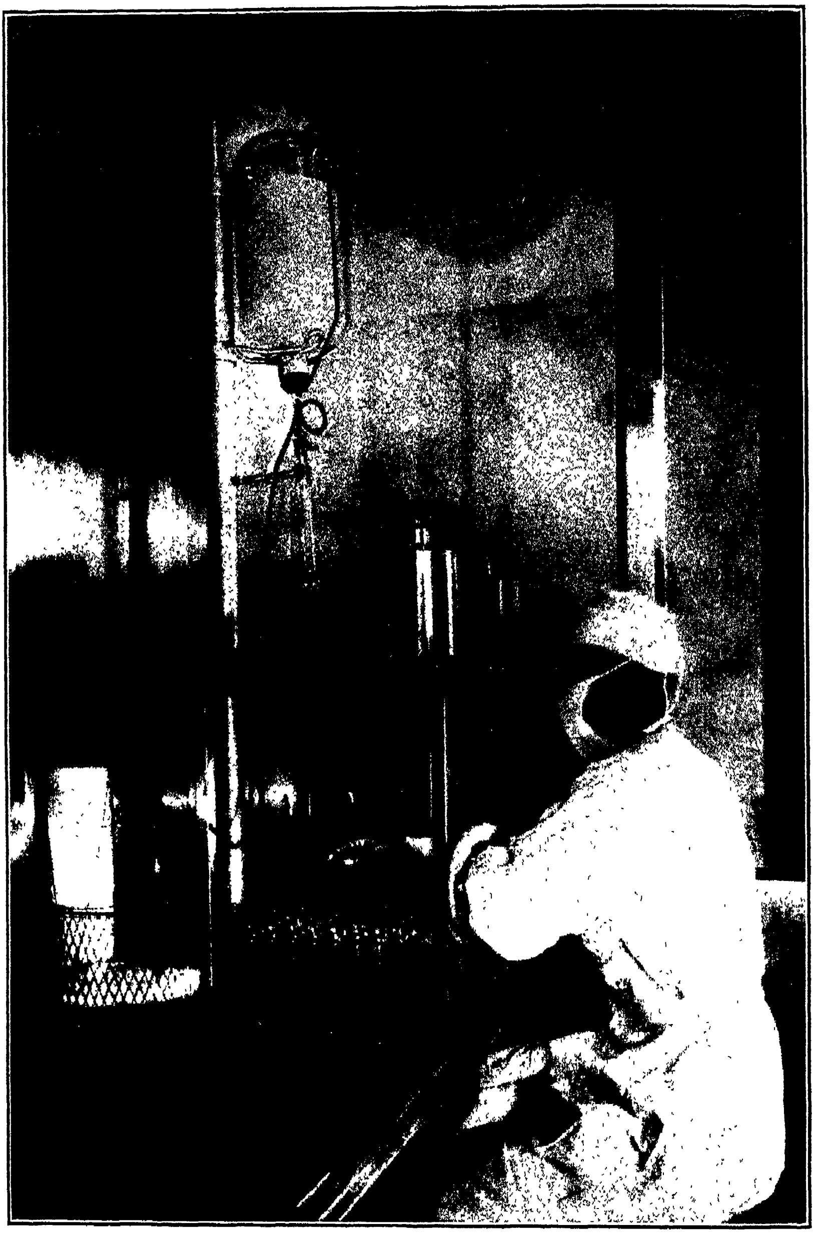

FIGURE 4.—The bottling apparatus, showing bottling cabinet.

has been steamed and now is receiving sufficient sterilized air to create distinct positive pressure so that no drafts can enter through any accidental leak that may have escaped careful inspection.

The technique of inoculation is simple. The equipment used consists of the section of flasks, the tube of seed culture held in its support, the cotton swab, and the Bunsen burner. A flask is picked up, the cotton plug removed, the mouth of the flask flamed, the cotton swab inserted into the seed culture suspension, then removed and passed over all parts of the surface of the agar in the flask, the swab is replaced in the seed tube, the mouth of the Kolle flask is flamed again, the cotton stopper is put back into the flask, the flask is returned to its rack, which is inclined so that water of condensation will run off the surface and collect at the low edge of the agar. Then, flask after flask is inoculated in the same manner. When all the flasks of a section have been thus planted, the tray with its 50 flasks is placed in the specially constructed incubator, with temperature and humidity control and circulating air, where it remains overnight, usually from 18 to 22 hours at 37.5° C.

As an important check on the maintenance of purity of the seed culture suspension, throughout the process of planting the flasks the portion of the suspension remaining in the tube, at the end, is plated on plain veal infusion agar. This must be a pure culture of the typhoid organism.

Harvesting (fig. 2).—Before the collection of the growth is begun, each Kolle flask, planted the day before, is inspected with the greatest care. Any flask showing the slightest suspicious evidence of atypical growth or contamination is discarded.

The materials required are the harvesting tool, flasks of sterile buffered saline, the 2-liter collecting flask with its rubber stopper and tubes, and the Bunsen burner. As noted in a preceding paragraph, one of the glass tubes has a gauze filter bag secured about its opening inside the collecting flask, the outer end of this tube being connected by means of sterile rubber tubing with the harvesting tool; the other glass tube is connected with the vacuum system. The rubber tubing for making these connections is sterilized separately in the autoclave, and the connections are made immediately before the harvesting begins; flame technique is used in this procedure.

Two technicians work together. A Kolle flask containing the growth of organisms is picked up by one man, who removes the cotton plug, flames the mouth, and pours into it about 20 cc of buffered saline. It is passed to the other man who, first using the collecting tool as a rake, carefully scrapes the bacterial growth from the surface of the agar. The growth readily mixes with the saline and makes a heavy, milky suspension; this suspension is then aspirated into the flask by releasing, to exactly the proper degree, the

pressure he maintains on the rubber tubing. The aspiration of air increases the danger of contamination. By the time the growth has been removed from the first flask, a second is ready with its 20 cc of saline added. This procedure is continued until the suspended bacteria of the entire section are in the collecting flask. The rubber tubes are removed from their glass connections in the rubber stopper, and the rubber stopper is taken out and replaced by a sterile gauze covered cotton stopper; then sufficient sterile buffered saline is added to bring the amount in the collecting flask up to 2 liters.

After thorough agitation to insure uniformity of the suspension, samples are removed—one of 10 cc for counting, and one of exactly 2 cc for the virulence test. The 2-cc quantities from each of the collecting flasks, resulting from 1 day's work, are pooled and kept cold until diluted for the mouse injections—about one-half hour. After it is labeled, the collecting flask is carried to the killing cubicle.

Killing.—The water bath provided for this purpose is heated by electricity, the temperature being automatically controlled to 0.1° C. The water is kept in constant circulation by a motor-driven pump to assure uniform temperature in all parts of the tank. It is of such size that 12 flasks of 2-liter capacity may be heated simultaneously. One flask containing water, and with a thermometer in it, serves as a guide to the rapidity with which the temperature in the other flasks rises and indicates when it reaches the desired maximum point (56° C.). The flasks rest on a perforated shelf raised from the bottom; the water is of such depth that its level is well above that of the suspension in the flasks. The flasks containing the concentrated suspensions are held in the water bath for 1 hour after the temperature in the control flask has reached 56° C. Upon removal from the bath, the flasks are allowed to cool to room temperature.

Standardization.—While the suspension is in the water bath, the 10-cc sample, collected at the completion of its harvesting, is counted. The technique employed is the direct method, using a Helber blood counting cell. The following are the steps in this procedure:

The heavy suspension received from the collecting flask is diluted with sterile buffered saline, in the proportion of 1 cc of suspension to 29 cc saline (in practice, 1+9; then, of this, 1+2); then this diluted suspension is mixed for counting as follows:

	cc
Diluted suspension	1.0
Sterile buffered saline containing 1.0 percent formalin	3.5
Carbol-methyl violet solution [1]	0.5

	cc
[1] Saturated alcoholic solution methyl violet 6B	1.0
5 percent aqueous solution of phenol, q. s. ad	100.0

The final dilution as counted is thus 1 to 150.

Place the mixture in a test tube; warm it over a Bunsen flame until it is almost at the boiling point; let it stand for 1 minute, then cool rapidly by placing it in ice water. With a capillary pipette, transfer a drop of the well-shaken mixture to a Helber cell-counting chamber, using a Hausser cover glass, 0.18 mm thick. On the microscope stage, find the ruled squares with the ⅔-inch objective; place a drop of cedar oil on the cover glass; turn to the oil immersion lens and bring the ruled area into focus; wait 10 minutes to allow the bacilli to settle into the same focal plane; count the number of bacteria in 20, or more, small squares, using the fine adjustment to detect bacilli which may not have settled; calculate the average number of bacteria per square. The squares are $\frac{1}{20}$ mm by $\frac{1}{20}$ mm; the chamber is $\frac{1}{50}$ mm deep; therefore, if the average number of bacilli per square was found, let us say, to be five, we would have in each cubic millimeter of the suspension which was mixed with the stain: $20\times20\times50\times5=100{,}000$. The number per cubic centimeter would be 1,000 times this, or 100,000,000. This figure, finally, is multiplied by the number of times (150) the original suspension was diluted for counting.

(NOTE.—The complete mathematical problem involved herein is avoided by a practical "short-cut" formula, as follows: Count the total number of bacilli found in 20 squares; multiply this figure by 0.3; the result will be the number of liters of vaccine of 1,000 million per cubic centimeter strength to be made from the 2 liters of heavy suspension in a collecting flask.)

Virulence test.—Black mice of a pure strain, known as Strain C–57,[1] have been found suitable for this test because of their relatively uniform susceptibility to typhoid infection by the intraperitoneal route. At the time of injection they weigh between 16 and 18 grams.

As previously noted (p. 838), from each of the 2-liter flasks of suspension harvested on one day, 2 cc are removed and mixed. This representative pooled suspension of live organisms is counted, in the regular way, then it is diluted so that the doses injected into the mice will be contained in 0.5 cc. Ringer's solution is used first to bring the number of bacilli in 1 cc down to 10 times the strength of the suspension injected into the mice; the final (1:10) dilution is made in mucin. Thus, the standard doses used to test the virulence of Strain 58 are 10,000, 1,000, and 100 bacilli; these numbers are to be contained in 0.5 cc. Therefore, with Ringer's solution the original suspension is diluted first to 200,000 bacilli per cubic centimeter; of this concentration, 1 cc is mixed with 9 cc Ringer's solution, giving 20,000 bacilli per cubic centimeter; then 1 cc of this second suspension is diluted with 9 cc Ringer's solution, making a suspension of which 1 cc contains 2,000 bacilli. Each of these three suspensions is then

[1] This is a pure genetic strain of black mice developed by Dr. C. C. Little, director of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. We have used this strain in all our recent experimental work on typhoid vaccine and found it to be highly satisfactory.

mixed in the proportion of 1 cc plus 9 cc of sterile buffered mucin mixture; the resultant mucin suspensions will contain in 0.5 cc amounts, the proper doses for the mice—10,000, 1,000, and 100 bacilli.

For the purposes of this test, 10 mice are injected with each dose. The mice are held under observation for 72 hours, when the result is recorded. It is expected that all mice receiving the higher doses will die within this period; some of those receiving the lowest dose may survive.

As a check on the cause of death, at least two mice are examined and cultures are made from the heart blood on veal infusion and EMB agar plates. Colonies are fished to Russell's double sugar and subjected to microscopic examination and agglutination tests.

These tests for mouse virulence are believed to be important. The indications which may be drawn from work done at the Army Medical School are that virulence and immunogenic potency tend to parallel one another.

Dilution.—Harvesting is completed in the earlier hours of the morning. Then the collected bacilli are killed in the water bath while the numbers of organisms per cubic centimeter in each flask of suspension are being determined by direct count. These procedures accomplished, the work for the afternoon is that of diluting the heavy suspension with buffered saline so that each cubic centimeter will contain 1,000 million bacilli. As a preservative, and to kill any bacilli surviving the temperature of the water bath, tricresol is added to a concentration of 0.25 percent.

The materials placed in the cubicle for making the dilutions include the following: The 2-liter flasks of concentrated, heated, suspension of bacilli labeled to show the result of the count, vaccine stock bottles of 8-liter capacity, each containing 5 liters of sterile buffered saline, several 1-liter and 2-liter flasks of sterile buffered saline, sterile 1,000-cc cylinder graduates, sterile 10-cc graduated pipettes, and a bottle of tricresol. For each of the 2-liter flasks of concentrated suspension, a suitable number of the 8-liter stock bottles is provided. Each of these has been tagged to show the calculated amount of the various components these stock bottles are to receive. The information on the tag is recorded as follows:

TYPHOID VACCINE

No ______________ Section ______________________________

Date made ____

Amount of tricresol ______________________________________ cc

Amount of suspension ____________________________________ cc

Amount of salt solution __________________________________ cc

Total amount of vaccine __________________________________ cc

Standardization: 1,000 million per cubic centimeter.

In making the dilution, the officer who does this work notes first the amount of tricresol required and measures the proper quantity into the 5 liters of sterile saline contained in the 8-liter stock bottle. The bottle is then shaken until thorough solution of the tricresol has been effected. Next the quantity of saline needed beyond the 5 liters is added from the 1-liter and 2-liter flasks provided. Finally, the amount of concentrated suspension shown on the tag is measured into the stock bottle, using for this the sterile graduated cylinder. After thorough agitation the bottle of diluted vaccine is set aside at room temperature for 48 hours. At the end of this time sterility tests are made. These consist of planting two fermentation tubes containing National Institute of Health sterility broth. If, after 96 hours' incubation no bacterial growth can be detected in any of the fermentation tubes, the vaccine is ready to be pooled.

Pooling.—In order that minor differences which may occur in the specific potency of various small lots of vaccine may be minimized, the contents of twenty to twenty-five 8-liter stock bottles are mixed or pooled. For this part of the work one cubicle is used exclusively. In it are the mixing chamber (fig. 3) and a steam generator. The mixing chamber is a heavy monel metal barrel, so set that it can be rotated on its axis, while inside it are baffles which aid in the thorough mixing of its contents. In its resting position it has, at its upper and lower sides, threaded tubulatures. The upper is closed by a cap which may be removed to be replaced by the steam-hose connection for sterilization or by a hooded sterile funnel to receive the vaccine which is to be pooled; the lower opening is protected by a bell-shaped funnel under which sterile bottles are placed to receive the pooled vaccine through a large stopcock. For sterilizing the chamber an arrangement of checkvalves, like those on autoclaves, is attached to the lower opening; this insures the escape of all air and condensation water, thus making the process of sterilization of the chamber identical with that of an autoclave. The special generator produces steam rapidly and in ample amount; a heavy, high-pressure hose conveys the steam to the upper opening. The chamber is sterilized for 20 minutes at 15 pounds pressure, just long enough beforehand to give it time to cool before the process of pooling is begun.

With the hooded funnel in place and the cut-off valve below, closed, vaccine is carefully poured in at the top, using flame technique. This completed, the barrel is turned back and forth by means of a large crank to mix thoroughly and insure uniformity of strength of the contained vaccine; then an air filter is attached to the upper opening, and the vaccine is drawn off into sterile 8-liter stock bottles, placed in succession under the funnel below.

These filled stock bottles are stoppered and labeled and their contents tested for sterility. The sterility tests are identical with those made on the vaccine 48 hours subsequent to dilution.

Biological tests.—Six animals are used in testing each lot of vaccine. Four mice each receive 0.5 cc of the vaccine intraperitoneally; a guinea pig receives 0.5 cc intraperitoneally for each 100 gm of its weight; a rabbit receives three doses—the first 0.5 cc subcutaneously, the second, 7 days later, 1 cc intravenously, and after 7 more days 1 cc intravenously. Ten days subsequent to the third dose the rabbit is bled and the specific agglutinin titer of its serum is determined. It is generally between 1:5,000 and 1:10,000. The agglutinating suspension consists of living bacilli (500 million per cubic centimeter) suspended in physiological saline. The tubes are incubated at 56° C. for 2 hours and stored in the refrigerator overnight. Complete agglutination only is read. These tests for agglutinins in the blood of the rabbit are intended only as a check on the identity of the bacilli in the vaccine. The mice and the guinea pig serve as checks on the tricresol content and the presence of any directly toxic or infectious substance. These animals are observed for 10 days. All animals dying within this period are carefully examined to determine the cause of the fatality. It must be ascertained whether or not death resulted from an intercurrent infection or from some cause inherent in the vaccine. If death from intercurrent infection should happen to be excluded, the tests are carefully repeated.

The reaction of each lot of vaccine is determined colorimetrically. Phenol red, 0.5 cc of a 0.02 percent solution, is added to 10 cc of vaccine. The buffer in the suspending saline solution holds the reaction at about pH 7.2. As a check on the quality of the glass, that is, to ascertain whether or not soluble substances in the glass are affecting the reaction of the vaccine, the pH of retained samples is investigated several months after filling.

Bottling.—The vaccine is distributed in 1-cc ampules and in 5-, 10-, 25-, and 50-cc vials. These are received at the filling cubicle in the metal boxes in which they were sterilized. The process of filling is illustrated in figure 4. It will be noted that the filling box is open on the side nearest the camera. In actual use the sides are closed by sterile towels wet with 3-percent cresol solution. In order to illustrate the filling technique, the towel was removed for this picture.

The stock bottle of vaccine is inverted above the sterilized filling cabinet after having been fitted with a rubber stopper which has two glass tubes running through it. One of these, the air-inlet tube, reaches nearly to the bottom of the bottle and is connected outside with a phenol solution air-washing bottle and a sterile cotton air filter. The other, the filling tube, is short, ending just inside the stopper. As the vaccine runs out through this tube, it passes by means of suitable rubber tubing through a sterile gauze filter, then through another rubber tube which enters the filling cabinet. The end of this tube has inserted into it a small section of glass tubing tapering to

form the filling nozzle. A pinch-cock clamps the rubber just above this end piece.

When the stock bottle of vaccine is in place, a tray of sterile ampules or vials is passed into the sterilized filling cabinet, then the technician, wearing sterilized clothing and rubber gloves, passes his hand into the cabinet through stockinette sleeves and fills the small containers one after another by manipulating the pinch-cock. The tray of filled containers is removed and stoppered, another tray immediately taking its place.

Final sterility tests.—The vaccine, bottled for issue, is stored at room temperature for 48 hours. Then sterility tests are made upon a random sample taken from a number of bottles. The number of bottles in the sample depends somewhat upon the number filled from the lot of vaccine. The following schedule is used:

Number of bottles filled:	*Number of bottles tested*
100 or less	3
101 to 150	4
151 to 200	5
201 to 250	6
251 to 300	7
301 to 350	8
351 to 400	9
Over 400	10

From each ampule or bottle at least two fermentation tubes are planted; one receives 0.25 cc, the other 1 cc of the vaccine. Care is exercised in the inoculation procedure to introduce the vaccine into the closed arm as well as into the aerobic chamber of the fermentation tubes.

Prior to inoculation all fermentation tubes are placed in an Arnold sterilizer for 30 minutes at 100° C., cooled to room temperature and planted immediately. Each tube is carefully inspected for air bubbles in the closed arm. If present, the tube is not used. The fermentation tubes are incubated at 37.5° C. for a period of 7 days. They are inspected at the end of 48, 96, and 168 hours. The vaccine may be released for distribution or shipment only if every tube is free of all evidence of bacterial growth.

Retained samples.—When a lot of vaccine is bottled for distribution, a number of the ampules and vials from that particular lot are withdrawn and stored for an indefinite period of time. When the contents of one 8-liter stock bottle is transferred into ampules and vials, the number of samples retained consists of five 1-cc ampules, two 5-cc vials, one 10-cc vial, one 25-cc vial, and one 50-cc vial. These samples are then available for future studies, such, for example, as a study to determine evidence of any deterioration which might occur.

Immunogenic potency test.—There is at present no generally accepted method by which the relative specific activity of typhoid vaccines

may be titrated. The need for such a test is self-evident, and work is now in progress at the Army Medical School which has as its object the development of a method for comparative standardization. The results of these studies will be the subject of a supplementary report.

REFERENCE

(1) Protective Antibodies in the Blood Serum of Individuals after Immunization with Typhoid Vaccine. By the Laboratory Staff, Army Medical School, Washington, D. C., under the supervision of J. F. Siler, M. D., Am. J. Pub. Health, 27 (2): 142 (February 1937).

PROVISIONAL SUMMARY OF INFANT MORTALITY, BY STATES, FOR 1936 AND COMPARISON WITH PRIOR YEARS

Provisional tabulations recently issued by the Bureau of the Census [1] show that there were 121,525 deaths of infants under 1 year of age in the United States in 1936, as compared with 120,138 reported in 1935. These figures give a provisional infant mortality rate (number of deaths under 1 year of age per 1,000 live births) of 56.9 for 1936, as compared with 55.7 for 1935. While this indicates a slight increase in infant mortality for 1936, the rate is still definitely below the general level of the past decade.

In terms of the infant mortality rate, 19 States showed some decrease and 29 States and the District of Columbia showed an increase. The greatest decreases in the rate were shown for New Mexico, North Dakota, New Hampshire, South Dakota, and Montana. The largest increases were for the District of Columbia, West Virginia, and Vermont.

All data for the years prior to 1936 are final tabulations. Figures for 1936 are based on hand counts of copies of death certificates received from State offices of vital statistics. For the States for which the shipment of copies to the Bureau of the Census is complete, these provisional figures will agree closely with the final tabulations. In other States it may be expected that a few delayed certificates will be added before final tabulations are completed.

For Colorado, Illinois, Rhode Island, and New York State (excepting New York City, which has made complete returns), transcripts for only 11 months have been received. For Arizona, transcripts for only 10 months have been received. In such cases, the 1936 provisional figure is based on the available 1936 data and the 1935 data for the months for which the 1936 information is lacking. The State total for Massachusetts is taken from State tabulations.

[1] Vital Statistics—Special Reports, Vol. 3, No. 23, pp. 115-117, June 14, 1937.

Number of deaths (exclusive of stillbirths) under 1 year of age in each State, 1932–36

State	1936[1]	1935	1934	1933	1932
Registration States	121, 525	120, 138	130, 185	120, 887	119, 431
Alabama	3, 913	3, 910	4, 303	3, 865	3, 835
Arizona	1, 093	1, 021	879	905	817
Arkansas	1, 742	1, 681	2, 029	1, 946	1, 697
California	4, 479	3, 978	4, 050	4, 027	4, 116
Colorado	1, 302	1, 370	1, 298	1, 183	1, 259
Connecticut	935	951	1, 085	1, 087	1, 173
Delaware	254	268	245	237	288
District of Columbia	847	642	662	669	740
Florida	1, 668	1, 736	1, 821	1, 614	1, 674
Georgia	4, 309	4, 320	5, 099	4, 070	4, 101
Idaho	512	483	471	404	379
Illinois	5, 232	5, 138	5, 825	5, 284	5, 884
Indiana	2, 798	2, 690	2, 960	2, 675	2, 903
Iowa	2, 051	1, 937	2, 149	1, 911	1, 938
Kansas	1, 556	1, 539	1, 574	1, 646	1, 525
Kentucky	3, 529	3, 388	3, 887	3, 213	8, 767
Louisiana	3, 118	2, 933	2, 971	2, 785	2, 804
Maine	983	990	1, 112	1, 002	1, 017
Maryland	1, 839	1, 689	1, 924	1, 805	1, 989
Massachusetts	2, 854	3, 041	3, 125	3, 299	8, 624
Michigan	4, 481	4, 172	4, 364	4, 090	4, 628
Minnesota	2, 112	2, 053	2, 168	2, 120	2, 189
Mississippi	2, 889	2, 605	3, 102	2, 818	2, 480
Missouri	3, 235	3, 262	3, 735	3, 176	3, 430
Montana	592	602	532	461	467
Nebraska	1, 050	960	1, 141	1, 193	1, 091
Nevada	100	101	85	99	88
New Hampshire	356	419	478	413	460
New Jersey	2, 383	2, 520	2, 678	2, 597	3, 075
New Mexico	1, 402	1, 705	1, 613	1, 674	1, 479
New York	8, 537	8, 852	9, 634	10, 026	10, 469
North Carolina	5, 216	5, 422	6, 212	4, 977	5, 183
North Dakota	664	811	833	791	779
Ohio	5, 313	5, 093	5, 379	5, 049	5, 951
Oklahoma	2, 507	2, 384	2, 864	2, 466	2, 052
Oregon	615	543	521	493	531
Pennsylvania	8, 120	8, 194	8, 812	8, 391	10, 113
Rhode Island	480	482	558	575	639
South Carolina	3, 169	3, 219	3, 674	3, 154	3, 204
South Dakota	594	674	764	705	668
Tennessee	3, 462	3, 414	3, 863	3, 473	3, 550
Texas	7, 660	8, 230	8, 381	8, 155	(2)
Utah	653	626	622	567	529
Vermont	375	320	347	325	381
Virginia	3, 781	3, 583	3, 805	3, 513	3, 670
Washington	1, 066	1, 012	973	811	967
West Virginia	2, 910	2, 533	2, 794	2, 472	2, 911
Wisconsin	2, 514	2, 419	2, 542	2, 446	2, 675
Wyoming	275	223	242	230	242

[1] 1936 figures are provisional.
[2] Not in registration area.

Infant death rates (deaths under 1 year of age per 1,000 live births) for each State, 1927–36

State	1936 [1]	1935	1934	1933	1932	1931	1930	1929	1928	1927
Registration States	56.9	55.7	60.1	58.1	57.6	61.6	64.6	67.6	68.7	64.6
Alabama	67.4	62.8	67.8	65.1	60.9	61.4	72.1	73.6	75.0	64.4
Arizona	108.9	111.7	103.5	111.4	95.9	109.6	116.6	133.3	141.5	130.1
Arkansas	54.0	47.1	54.1	54.4	45.3	49.0	51.5	58.1	66.9	60.9
California	53.1	49.6	51.7	53.7	52.7	56.7	58.7	63.2	62.2	62.3
Colorado	73.0	72.7	72.7	68.9	71.5	81.0	94.3	91.4	89.4	(2)
Connecticut	42.1	42.7	48.8	48.4	49.4	53.8	56.0	64.4	58.6	58.8
Delaware	64.8	66.4	61.4	60.4	67.1	81.7	78.5	81.2	78.4	70.6
District of Columbia	72.5	59.4	65.3	67.2	72.9	67.0	70.8	70.7	65.1	67.6
Florida	59.4	61.9	68.2	62.9	61.1	63.9	64.2	65.5	67.1	67.4
Georgia	69.9	68.3	78.9	66.7	64.4	68.3	77.4	76.3	81.6	(2)
Idaho	50.5	51.0	50.3	47.2	43.4	55.9	57.1	55.3	59.0	50.0
Illinois	47.7	45.9	52.8	49.0	52.8	58.6	55.8	61.4	64.2	64.4
Indiana	51.8	50.8	56.5	53.0	54.7	57.6	57.7	63.6	62.5	58.8
Iowa	48.1	47.1	50.6	48.3	47.9	49.0	53.9	52.6	53.0	55.5
Kansas	51.9	50.3	48.5	53.5	48.1	47.9	52.6	57.6	59.0	55.3
Kentucky	63.3	58.7	64.9	58.1	63.3	65.0	65.4	70.9	69.6	61.0
Louisiana	72.8	69.4	69.1	70.1	64.8	65.9	78.2	74.0	78.4	77.4
Maine	64.6	63.0	70.6	66.3	63.1	71.5	75.7	77.4	72.5	80.0
Maryland	69.2	62.0	70.4	65.8	69.0	80.5	75.3	79.9	79.6	81.5
Massachusetts	45.3	48.3	49.0	52.0	52.9	54.5	60.1	61.8	64.3	64.5
Michigan	50.7	47.7	52.0	50.5	54.0	57.0	62.7	66.4	69.4	67.7
Minnesota	44.4	44.7	47.2	47.6	47.2	50.6	52.5	51.2	53.6	51.9
Mississippi	58.4	53.9	64.8	63.6	53.6	55.9	67.7	72.1	73.8	66.8
Missouri	58.6	56.9	63.1	55.4	57.2	62.8	58.6	62.1	65.6	59.7
Montana	56.9	60.0	53.5	51.5	51.4	60.5	58.5	64.0	61.4	66.4
Nebraska	44.1	41.2	45.5	49.3	43.4	48.8	49.4	51.7	52.8	51.2
Nevada	70.4	71.0	59.3	73.2	69.8	74.4	68.3	67.2	(2)	(2)
New Hampshire	46.6	53.9	60.7	55.9	58.9	57.3	61.4	68.2	69.4	69.2
New Jersey	44.3	46.2	49.1	46.3	50.2	56.8	56.5	60.1	65.2	61.3
New Mexico	114.7	129.3	126.3	136.1	119.4	134.4	145.4	145.5	(2)	(2)
New York	46.8	48.0	51.9	53.6	52.8	57.4	58.8	60.8	65.0	59.4
North Carolina	68.5	68.8	77.9	66.0	66.5	72.9	78.6	79.1	85.7	79.1
North Dakota	49.6	59.4	57.3	60.0	55.5	58.8	61.7	67.2	59.5	63.4
Ohio	51.3	50.4	53.7	52.7	58.5	60.0	60.7	68.8	66.1	61.8
Oklahoma	59.9	54.6	60.5	56.4	50.0	51.5	60.7	70.2	69.0	(2)
Oregon	44.1	41.2	39.8	40.3	41.3	43.7	50.0	47.9	46.6	47.5
Pennsylvania	50.9	50.8	55.0	53.4	60.0	66.7	68.0	70.5	72.1	69.0
Rhode Island	47.1	47.2	53.9	55.5	57.2	60.8	61.8	72.0	67.2	66.5
South Carolina	80.8	79.3	83.0	78.2	77.2	81.0	88.7	91.0	96.5	(3)
South Dakota	47.3	52.5	58.0	54.8	50.4	(2)	(2)	(2)	(2)	(2)
Tennessee	68.5	64.0	73.7	69.3	67.6	67.6	75.7	77.1	80.9	71.1
Texas	69.0	71.7	71.9	75.5	(2)	(2)	(2)	(2)	(2)	(2)
Utah	52.1	49.3	49.2	47.6	44.2	51.4	57.4	59.1	58.9	54.3
Vermont	58.2	48.6	52.6	53.0	63.2	59.9	64.8	65.8	65.2	69.8
Virginia	73.8	69.6	72.6	68.5	67.2	76.3	77.3	78.8	75.9	75.5
Washington	45.6	45.2	43.2	38.8	45.2	48.3	48.7	49.0	48.1	49.8
West Virginia	71.2	60.6	67.4	68.2	75.0	77.2	81.0	77.6	70.1	71.9
Wisconsin	47.8	46.0	49.4	48.5	50.4	53.1	55.7	59.6	61.4	59.1
Wyoming	58.2	51.1	53.0	54.7	57.0	66.8	69.3	70.3	67.8	68.9

[1] 1936 figures are provisional.
[2] Not added to birth registration until a later date.
[3] Dropped from the registration area in 1925; readmitted in 1928.

DEATHS DURING WEEK ENDED JUNE 5, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 5, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	8,129	8,316
Average for 3 prior years	8,017	
Total deaths, first 22 weeks of year	211,117	207,145
Deaths under 1 year of age	549	487
Average for 3 prior years	572	
Deaths under 1 year of age, first 22 weeks of year	13,015	12,802
Data from industrial insurance companies:		
Policies in force	69,785,134	68,357,506
Number of death claims	10,174	12,721
Death claims per 1,000 policies in force, annual rate	7.6	9.7
Death claims per 1,000 policies, first 22 weeks of year, annual rate	10.9	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 12, 1937, and June 13, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936
New England States:								
Maine		1				172	0	0
New Hampshire	1				75	7	0	0
Vermont					2	158	0	0
Massachusetts	3	7			634	1,084	2	5
Rhode Island	2	2			69	22	0	1
Connecticut	3		4		130	213	0	2
Middle Atlantic States:								
New York	43	41	[1] 5	[1] 3	1,586	2,546	7	18
New Jersey	6	10	5	4	1,123	430	2	3
Pennsylvania	25	15			1,727	875	7	2
East North Central States:								
Ohio	11	16	14	29	2,290	725	3	5
Indiana	4	5	15	4	379	9	2	1
Illinois	39	59	18	22	457	26	5	6
Michigan	13	6		1	279	75	3	3
Wisconsin	3	1	19	4	52	168	1	1
West North Central States:								
Minnesota	3		2	1	8	199	0	3
Iowa [2]		2			7	5	0	3
Missouri	7	18	23	22	56	14	1	3
North Dakota	2		11		1	3	0	0
South Dakota	1				2		1	0
Nebraska		1		3	10	19	0	1
Kansas	4	3	7	1	25	14	1	0
South Atlantic States:								
Delaware	1	1			22	10	0	0
Maryland [2 3 4]	5	6	1	1	195	333	3	3
District of Columbia	7	7			93	125	0	3
Virginia	6	9			228	81	7	4
West Virginia	6	4	17	11	39	95	3	6
North Carolina [3]	5	7			196	25	2	5
South Carolina	2	6	85	25	63	30	3	3
Georgia [3]	4	7					0	1
Florida [3]	8		2	7		11	4	1
East South Central States:								
Kentucky	6	5	1	11	198	16	5	3
Tennessee [2 3]	6	8	16	8	94	11	4	3
Alabama [3]	10	3	9	6	24		7	4
Mississippi [4]	1	6					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 12, 1937, and June 13, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936
West South Central States:								
Arkansas	3	-------	7	10	6	11	1	1
Louisiana [3]	13	11	14	22	-------	15	2	3
Oklahoma [5]	8	-------	18	27	33	5	0	1
Texas [3]	26	25	135	78	366	125	7	0
Mountain States:								
Montana [2]	3	-------	-------	19	8	14	0	0
Idaho [2]	4	1	1	-------	69	1	0	0
Wyoming [2, 6]	1	-------	-------	-------	21	-------	0	0
Colorado [2]	3	4	-------	-------	21	25	0	0
New Mexico	1	2	-------	1	60	56	0	1
Arizona	2	5	10	8	53	70	0	0
Utah [4]	-------	-------	-------	-------	49	19	0	0
Pacific States:								
Washington	3	-------	-------	-------	93	199	0	1
Oregon [2]	-------	1	10	-------	10	63	1	0
California	31	25	63	212	273	1,135	3	5
Total	335	330	512	540	11,121	9,230	88	100
First 23 weeks of year	10,665	11,753	271,539	136,266	202,181	235,711	3,516	5,123

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936
New England States:								
Maine	0	0	13	7	0	0	1	1
New Hampshire	0	0	1	3	0	0	0	0
Vermont	0	0	1	7	0	0	0	9
Massachusetts	1	2	164	188	0	0	1	1
Rhode Island	0	0	37	23	0	0	0	2
Connecticut	0	0	91	62	0	0	1	1
Middle Atlantic States:								
New York	0	2	574	607	0	0	15	11
New Jersey	0	1	101	174	0	0	2	4
Pennsylvania	1	0	500	261	0	0	8	12
East North Central States:								
Ohio	0	0	310	270	8	0	5	8
Indiana	0	0	63	63	7	4	1	4
Illinois	1	1	392	431	15	19	5	6
Michigan	0	0	591	375	12	0	2	7
Wisconsin	0	0	189	361	2	5	2	1
West North Central States:								
Minnesota	0	0	26	150	14	3	0	2
Iowa [2]	0	0	94	126	30	19	4	9
Missouri	1	1	107	85	16	80	7	5
North Dakota	0	1	13	21	7	9	0	0
South Dakota	0	0	15	26	0	27	0	0
Nebraska	1	0	28	39	0	12	2	0
Kansas	0	0	72	131	5	8	1	53
South Atlantic States:								
Delaware	0	0	7	3	0	0	0	1
Maryland [2, 3, 4]	0	1	21	43	0	0	8	3
District of Columbia	0	0	6	11	0	0	0	0
Virginia	0	0	10	22	0	0	9	14
West Virginia	0	0	34	20	0	0	2	6
North Carolina [3]	1	2	16	15	0	0	3	4
South Carolina	2	0	-------	1	0	0	16	8
Georgia [3]	2	0	3	9	0	0	11	18
Florida [3]	0	2	5	5	0	0	0	2
East South Central States:								
Kentucky	0	0	19	11	3	0	9	9
Tennessee [2, 3]	2	0	10	15	0	0	11	12
Alabama [3]	1	1	5	5	1	0	11	4
Mississippi [4]	7	0	5	7	0	0	5	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 12, 1937, and June 13, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936	Week ended June 12, 1937	Week ended June 13, 1936
West South Central States:								
Arkansas	4	0	13	4	0	0	6	4
Louisiana [3]	2	2	9	--------	1	1	11	13
Oklahoma [5]	3	0	9	21	1	0	11	10
Texas [3]	5	2	101	28	1	5	26	12
Mountain States:								
Montana [2]	0	0	11	49	6	12	0	1
Idaho [2]	0	0	20	5	1	0	0	2
Wyoming [2 6]	0	0	28	11	3	3	1	0
Colorado [2]	0	0	10	49	0	0	4	0
New Mexico	0	0	32	44	0	0	0	6
Arizona	0	0	4	17	0	0	3	0
Utah [4]	0	0	15	24	0	3	0	0
Pacific States:								
Washington	0	0	25	43	0	2	0	2
Oregon [2]	0	0	30	29	7	16	1	2
California	4	2	181	261	8	0	4	10
Total	38	20	4,011	4,162	148	223	209	282
First 23 weeks of year	506	402	149,164	162,851	6,898	5,091	2,815	2,849

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended June 12, 1937, 22 cases, as follows: Iowa, 4; Maryland, 1; Tennessee, 1; Montana, 3; Idaho, 1; Wyoming, 8; Colorado, 3; Oregon, 1.
[3] Typhus fever, week ended June 12, 1937, 51 cases, as follows: Maryland, 2; North Carolina, 1; Georgia, 18; Florida, 6; Tennessee, 2; Alabama, 11; Louisiana, 1 (delayed report); Texas, 10.
[4] Week ended earlier than Saturday.
[5] Figures for 1936 are exclusive of Oklahoma City and Tulsa.
[6] Colorado tick fever, week ended June 12, 1937, Wyoming, 5 cases.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1937										
Massachusetts	31	12	-------	-------	3,773	-------	-------	1,184	0	9
Michigan	11	48	15	5	332	-------	1	3,992	27	14
Vermont	-------	1	-------	-------	5	-------	0	33	0	1
April 1937										
Puerto Rico	-------	26	1,144	643	145	1	1	-------	0	78
May 1937										
Colorado	3	21	2	-------	94	-------	0	140	36	3
District of Columbia	5	34	3	-------	485	1	0	51	0	3
Idaho	1	4	68	2	98	-------	0	84	23	8
Maine	1	3	6	-------	71	-------	0	97	0	4
New Mexico	1	6	4	6	344	-------	0	86	3	9
West Virginia	32	25	95	-------	269	2	0	278	3	10
Wyoming	1	1	-------	-------	7	-------	-------	43	14	0

March 1937

	Cases
Chicken pox:	
Massachusetts	1,471
Michigan	2,440
Vermont	1
Dysentery:	
Massachusetts (bacillary)	1
Michigan (amoebic)	1
Michigan (bacillary)	1
Encephalitis, epidemic or lethargic:	
Michigan	2
German measles:	
Massachusetts	106
Michigan	696
Vermont	5
Lead poisoning:	
Massachusetts	2
Mumps:	
Massachusetts	971
Michigan	2,247
Ophthalmia neonatorum:	
Massachusetts	111
Rabies in animals:	
Massachusetts	21
Michigan	3
Septic sore throat:	
Massachusetts	22
Michigan	60
Trachoma:	
Massachusetts	2
Trichinosis:	
Massachusetts	2
Tularaemia:	
Michigan	4
Undulant fever:	
Michigan	5
Vermont	2
Vincent's infection:	
Michigan	22
Whooping cough:	
Massachusetts	2,013
Michigan	1,226
Vermont	114

April 1937

	Cases
Puerto Rico:	
Chicken pox	48
Dysentery	27
Paratyphoid fever	1
Puerperal septicemia	4
Tetanus	15
Whooping cough	28

May 1937

	Cases
Anthrax:	
West Virginia	9
Chicken pox:	
Colorado	148
District of Columbia	140
Idaho	90
Maine	281
New Mexico	63
West Virginia	132
Wyoming	39
Colorado tick fever:	
Wyoming	4
Conjunctivitis:	
Idaho	6
Dysentery:	
Idaho	2
New Mexico (amoebic)	2
Encephalitis, epidemic or lethargic:	
Idaho	2
German measles:	
Idaho	1
Maine	70
New Mexico	3
Wyoming	35
Impetigo contagiosa:	
Colorado	3
Mumps:	
Colorado	53
Idaho	78
Maine	204
New Mexico	33
West Virginia	70
Wyoming	96

May 1937—Continued

	Cases
Paratyphoid fever:	
West Virginia	1
Rabies in animals:	
Maine	1
West Virginia	3
Rocky Mountain spotted fever:	
Colorado	5
Idaho	12
New Mexico	1
Wyoming	25
Septic sore throat:	
Colorado	1
Idaho	8
New Mexico	5
Wyoming	3
Tetanus:	
Maine	2
Trachoma:	
Idaho	1
Tularaemia:	
West Virginia	1
Wyoming	1
Typhus fever:	
Colorado	3
Undulant fever:	
Idaho	1
Maine	1
New Mexico	1
West Virginia	1
Vincent's infection:	
Idaho	2
Maine	10
Whooping cough:	
Colorado	157
Idaho	89
Maine	235
New Mexico	93
West Virginia	371
Wyoming	15

CASE OF HUMAN PLAGUE IN DOUGLAS COUNTY, NEV. (PROVISIONAL DIAGNOSIS)

Under date of June 4, 1937, Surg. C. R. Eskey states that a provisional laboratory diagnosis of plague has been made in a patient who had been living at Lake Tahoe, Douglas County, Nev., about 6 miles from the cottage of a patient who developed plague last year.[1]

[1] PUBLIC HEALTH REPORTS, Oct. 2, 1936, p. 1392.

CASES OF VENEREAL DISEASES REPORTED FOR APRIL 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,166	4.11	390	1.38
Arizona	56	1.45	97	2.51
Arkansas	471	2.36	283	1.42
California	1,920	3.40	1,640	2.91
Colorado	124	1.17	56	.53
Connecticut [1]	190	1.11	105	.61
Delaware	203	7.93	49	1.91
District of Columbia	188	3.16	162	2.73
Florida	68	.42	29	.18
Georgia	1,424	4.26	416	1.24
Idaho	53	1.11	51	1.06
Illinois	2,254	2.88	1,263	1.62
Indiana	215	.63	127	.87
Iowa	10	.04	9	.04
Kansas	152	.82	77	.42
Kentucky [2]				
Louisiana	205	.97	143	.67
Maine [2]				
Maryland [1]	830	4.97	237	1.42
Massachusetts	560	1.28	453	1.04
Michigan	794	1.70	586	1.26
Minnesota	365	1.39	264	1.00
Mississippi	1,900	9.69	2,382	12.15
Missouri	171	.44	102	.26
Montana [3]				
Nebraska	52	.38	55	.40
Nevada [3]				
New Hampshire	9	.18	8	.16
New Jersey	669	1.56	230	.54
New Mexico	136	3.38	57	1.42
New York	8,192	6.36	1,731	1.34
North Carolina	2,102	6.15	456	1.33
North Dakota	30	.43	42	.60
Ohio [1]	1,071	1.60	243	.36
Oklahoma [1]	441	1.76	251	1.00
Oregon	73	.72	186	1.85
Pennsylvania [4]	1,353	1.34	176	.17
Rhode Island	79	1.16	71	1.04
South Carolina [1]	463	2.30	458	2.28
South Dakota	64	.95	25	.37
Tennessee	897	3.09	238	.82
Texas	170	.28	28	.05
Utah [3]				
Vermont	27	.72	17	.45
Virginia [1]	566	2.15	226	.86
Washington	313	1.92	384	2.35
West Virginia [2]				
Wisconsin [4]	29	.10	117	.40
Wyoming [2]				
Total	30,055	2.49	13,920	1.15

See footnotes at end of table.

Reports from cities of 200,000 population or over

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Akron, Ohio [2]				
Atlanta, Ga	161	5.61	114	3.97
Baltimore, Md	475	5.76	149	1.81
Birmingham, Ala	166	5.88	79	2.80
Boston, Mass	220	2.78	183	2.31
Buffalo, N. Y	261	4.41	102	1.72
Chicago, Ill	1,169	3.28	813	2.28
Cincinnati, Ohio [1]				
Cleveland, Ohio	245	2.63	80	.86
Columbus, Ohio	81	2.65	17	.56
Dallas, Tex.[3]				
Dayton, Ohio [2]				
Denver, Colo	107	3.61	53	1.79
Detroit, Mich.[3]				
Houston, Tex.[5]	170	5.08	28	.84
Indianapolis, Ind.[3]				
Jersey City, N. J.[3]				
Kansas City, Mo	48	1.14	15	.36
Los Angeles, Calif	510	3.56	500	3.49
Louisville, Ky.[3]				
Memphis, Tenn	238	8.91	67	2.51
Milwaukee, Wis.[3]				
Minneapolis, Minn	93	1.91	93	1.91
Newark, N. J	260	5.61	132	2.85
New Orleans, La.[3]				
New York, N. Y	7,626	10.44	1,273	1.74
Oakland, Calif.[3]				
Omaha, Nebr	16	.73	8	.36
Philadelphia, Pa.[3]				
Pittsburgh, Pa	76	1.11	38	.56
Portland, Oreg.[3]				
Providence, R. I	46	1.78	37	1.43
Rochester, N. Y	36	1.07	59	1.75
St. Louis, Mo	178	2.13	122	1.46
St. Paul, Minn	63	2.23	41	1.45
San Antonio, Tex	63	2.51	188	7.48
San Francisco, Calif	261	3.89	172	2.56
Seattle, Wash	137	3.61	136	3.58
Syracuse, N. Y	87	3.99	56	2.57
Toledo, Ohio	88	3.89	37	1.22
Washington, D. C.[6]	188	3.16	162	2.73

[1] Incomplete.
[2] No report for current month.
[3] Not reporting.
[4] Only cases of syphilis in the infectious stage are reported.
[5] Reported by Jefferson Davis Hospital; physicians are not required to report venereal disease.
[6] Reported by the Social Hygiene Clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 5, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	191	95	81	5,649	524	1,871	16	414	37	1,358	
Current week [1]	128	40	36	4,033	488	1,637	23	376	21	1,193	
Maine:											
Portland	0		0	4	3	0	0	0	0	0	23
New Hampshire:											
Concord	0		0	2	0	0	0	0	0	0	10
Manchester											
Nashua	0		0	0	1	2	0	0	0	0	6

[1] Figures for Barre, Vt., and Newark, N. J., estimated; reports not received.

City reports for week ended June 5, 1937—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	1	0	0	0	0	12
Rutland	0	------	0	1	2	1	0	0	0	0	6
Massachusetts:											
Boston	1	------	1	50	15	64	0	6	0	33	218
Fall River	0	------	1	29	2	0	0	1	0	2	35
Springfield	0	------	0	1	1	2	0	3	0	9	33
Worcester	0	------	0	17	7	4	0	2	0	17	------
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	20
Providence	0	------	1	57	3	30	0	4	0	41	77
Connecticut:											
Bridgeport	0	------	0	3	1	52	0	0	0	1	28
Hartford	0	------	0	36	2	7	0	3	0	3	------
New Haven	0	------	0	4	1	3	0	1	0	1	21
New York:											
Buffalo	0	------	0	115	5	18	0	11	0	24	162
New York	31	6	6	877	84	249	0	77	4	72	1,440
Rochester	1	------	0	12	5	6	0	1	0	17	68
Syracuse	0	------	0	22	2	15	0	0	0	16	47
New Jersey:											
Camden	0	1	0	30	1	3	0	0	0	2	36
Newark	------	------	------	------	------	------	------	------	------	------	------
Trenton	0	------	0	29	3	5	0	0	0	1	38
Pennsylvania:											
Philadelphia	0	4	3	42	17	157	0	27	2	36	467
Pittsburgh	2	2	2	261	11	35	0	4	0	36	160
Reading	0	------	1	116	1	4	0	1	0	2	35
Scranton	0	------	------	0	------	4	0	------	0	0	------
Ohio:											
Cincinnati	1	------	0	79	6	13	0	8	0	13	122
Cleveland	2	4	0	516	24	73	0	16	0	35	196
Columbus	0	------	0	23	6	6	0	1	0	22	58
Toledo	0	1	1	338	2	9	0	6	0	37	57
Indiana:											
Anderson	0	------	0	21	2	5	0	0	0	2	11
Fort Wayne	0	------	0	0	2	0	0	2	0	0	22
Indianapolis	1	------	1	314	10	9	2	6	0	20	118
Muncie	0	------	0	0	2	0	0	0	0	0	14
South Bend	0	------	0	0	0	3	0	0	0	1	16
Terre Haute	1	------	0	0	0	4	4	0	0	0	10
Illinois:											
Alton	0	------	0	1	0	3	0	0	1	3	8
Chicago	30	4	3	326	40	229	0	37	1	56	677
Elgin	0	------	0	0	2	3	0	0	0	7	9
Moline	0	------	0	0	0	3	14	0	0	9	3
Springfield	0	------	0	19	2	0	0	1	0	3	11
Michigan:											
Detroit	8	------	3	98	33	265	2	19	0	60	269
Flint	0	------	0	29	2	18	0	1	0	1	28
Grand Rapids	1	------	0	62	3	9	0	1	0	27	41
Wisconsin:											
Kenosha	0	------	0	0	1	6	0	0	0	1	12
Madison	0	------	0	1	0	4	0	0	0	2	12
Milwaukee	0	------	0	19	7	31	0	6	0	22	113
Racine	0	------	0	0	0	6	0	0	0	0	10
Superior	1	------	0	0	0	0	0	0	0	0	10
Minnesota:											
Duluth	1	------	0	0	2	25	0	0	0	0	26
Minneapolis	1	------	0	1	4	5	0	1	0	11	98
St. Paul	0	------	0	4	6	5	0	0	0	71	69
Iowa:											
Cedar Rapids	0	------	------	0	------	4	1	------	0	0	------
Davenport	0	------	------	0	------	2	1	------	0	0	------
Des Moines	0	------	------	0	------	18	1	------	0	0	33
Sioux City	0	------	------	0	------	7	0	------	0	1	0
Waterloo	0	------	------	1	------	7	0	------	0	0	------
Missouri:											
Kansas City	2	------	1	2	2	30	0	3	0	9	79
St. Joseph	0	------	0	0	2	6	1	0	0	3	24
St. Louis	3	------	0	27	6	80	0	9	3	44	200
North Dakota:											
Fargo	0	------	0	0	0	1	0	0	0	7	11
Grand Forks	0	------	------	0	------	0	1	------	0	8	------
Minot	0	------	0	0	0	0	4	0	0	0	2
South Dakota:											
Aberdeen	0	------	------	0	------	2	0	------	0	0	------

City reports for week ended June 5, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallbox cafes	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Nebraska:											
Omaha	0	------	0	0	2	6	0	2	0	10	51
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	3
Topeka	0	------	0	0	4	2	0	0	0	4	16
Wichita	1	------	0	6	3	0	0	0	0	7	18
Delaware:											
Wilmington	0	------	0	0	3	1	0	1	0	0	26
Maryland:											
Baltimore	2	------	2	135	21	14	0	16	0	55	219
Cumberland	0	------	0	0	0	0	0	0	0	6	10
Frederick	0	------	0	0	0	0	0	0	0	0	2
Dist. of Columbia:											
Washington	8	1	1	110	7	3	0	11	2	15	169
Virginia:											
Lynchburg	0	------	0	4	1	1	0	0	0	14	11
Norfolk	0	------	0	15	4	0	0	0	0	0	27
Richmond	1	------	0	0	4	4	0	3	1	0	46
Roanoke	0	------	0	52	2	1	0	1	0	0	20
West Virginia:											
Charleston	0	1	0	0	1	0	0	0	1	0	15
Huntington	1	------	------	0	------	1	0	------	0	0	------
Wheeling	1	------	1	2	3	0	0	1	0	11	17
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	2	------
Raleigh	0	------	0	1	1	1	0	0	0	1	18
Wilmington	0	------	0	0	1	0	0	0	0	0	12
Winston-Salem	0	------	0	1	0	1	0	0	0	9	12
South Carolina:											
Charleston	0	------	0	1	5	0	0	3	0	0	21
Florence	0	------	0	0	0	0	0	0	0	0	9
Greenville	0	------	0	0	0	0	0	0	1	1	7
Georgia:											
Atlanta	0	3	1	0	3	4	0	6	1	15	80
Brunswick	0	------	0	0	1	0	0	0	0	0	3
Savannah	0	------	0	0	2	0	0	1	0	8	30
Florida:											
Miami	0	1	1	0	0	1	0	5	0	0	44
Tampa	1	------	0	21	1	3	0	0	1	6	24
Kentucky:											
Covington	0	------	0	54	2	3	0	3	0	3	18
Lexington	0	------	0	20	2	1	0	2	0	21	23
Louisville	0	4	0	59	5	28	0	4	0	69	75
Tennessee:											
Knoxville	0	------	1	0	5	0	0	1	0	0	35
Memphis	0	------	0	57	5	1	0	5	0	34	92
Nashville	0	------	0	8	11	0	0	0	0	12	61
Alabama:											
Birmingham	1	4	0	20	6	1	0	3	0	9	75
Mobile	0	------	0	0	3	0	0	1	0	1	26
Montgomery	0	4	------	0	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	4	0	------	0	0	------
Little Rock	0	------	0	0	2	0	0	0	0	0	------
Louisiana:											
Lake Charles	0	------	0	1	0	0	0	0	0	0	8
New Orleans	7	2	0	6	11	11	0	10	0	0	147
Shreveport	0	------	0	0	3	1	0	1	1	0	55
Oklahoma:											
Muskogee	0	------	------	0	------	0	0	------	0	0	------
Oklahoma City	1	------	0	8	4	4	0	0	1	2	43
Tulsa	0	------	------	3	------	1	0	------	0	11	------
Texas:											
Dallas	0	2	2	31	2	3	0	2	0	26	58
Fort Worth	0	------	0	0	2	5	0	4	1	23	35
Galveston	0	------	0	3	3	0	0	2	0	0	18
Houston	3	------	0	2	3	3	0	3	2	0	64
San Antonio	0	------	1	0	10	0	0	10	0	0	94
Montana:											
Billings	0	------	0	0	1	0	0	0	0	2	12
Great Falls	0	------	0	0	1	0	5	0	0	1	5
Helena	0	------	0	0	0	2	0	0	0	1	5
Missoula	0	------	0	0	2	0	5	0	0	0	9
Idaho:											
Boise	0	------	0	0	0	0	0	0	0	0	11

City reports for week ended June 5, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Colorado:											
Colorado Springs	0	------	0	1	3	1	0	0	0	0	12
Denver	0	------	1	16	5	4	1	2	0	21	80
Pueblo	0	------	0	0	0	0	0	0	0	0	13
New Mexico:											
Albuquerque	0	------	0	4	1	2	0	0	0	2	12
Utah:											
Salt Lake City	0	------	1	78	3	7	0	1	0	8	34
Washington:											
Seattle	2	------	0	10	2	2	0	3	1	38	79
Spokane	1	------	0	35	1	6	0	0	0	5	34
Tacoma	1	------	0	0	1	6	0	0	0	1	27
Oregon:											
Portland	0	------	0	2	6	13	0	2	0	3	81
Salem	0	1	------	0	------	0	0	------	0	7	------
California:											
Los Angeles	9	5	2	30	6	35	3	22	1	89	250
Sacramento	1	------	0	34	1	2	0	1	0	9	27
San Francisco	1	------	0	10	9	17	0	7	0	42	158

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				West Virginia:			
Boston	1	1	0	Huntington	1	0	0
Fall River	0	1	0	Wheeling	1	0	0
Rhode Island:				Florida:			
Providence	1	0	0	Miami	1	1	0
New York:				Tennessee:			
New York	4	0	1	Memphis	1	0	0
Rochester	0	0	1	Nashville	1	0	0
Pennsylvania:				Alabama:			
Philadelphia	1	0	0	Birmingham	2	1	0
Pittsburgh	0	1	0	Mobile	1	0	0
Ohio:				Arkansas:			
Cincinnati	1	1	0	Little Rock	0	1	0
Michigan:				Louisiana:			
Detroit	1	0	0	Shreveport	0	2	0
Missouri:				Texas:			
St. Louis	1	0	0	Houston	1	0	0
Nebraska:				San Antonio	1	0	0
Omaha	0	0	2	California:			
Maryland:				Los Angeles	0	1	2
Baltimore	3	2	0	Sacramento	1	0	0
District of Columbia:							
Washington	4	3	0				

Dengue.—Cases: San Francisco, 1.

Encephalitis, epidemic or lethargic.—Cases: Toledo, 1; Lawrence, 1; Baltimore, 1.

Pellagra.—Cases: Washington, 1; Charleston, S. C., 1; Savannah, 1; Miami, 1; Birmingham, 2; Montgomery, 2; New Orleans, 2; San Francisco, 1.

Rabies in man.—Deaths: Philadelphia, 1; Mobile, 1.

Typhus fever.—Cases: New York, 1; Springfield, Ill., 1; Savannah, 1; Mobile, 1; Galveston, 1. Deaths: Springfield, Ill., 1.

FOREIGN AND INSULAR

EGYPT

Infectious diseases—Third quarter, 1936.—During the third quarter of 1936, certain infectious diseases were reported in Egypt as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis		19	Plague	4	1
Chicken pox	52	3	Poliomyelitis	3	3
Diphtheria	496	252	Puerperal septicemia	128	101
Dysentery	1,089	178	Rabies	8	8
Erysipelas	949	230	Scarlet fever	7	
Influenza	2,653	82	Tetanus	97	75
Leprosy	20	13	Tuberculosis (pulmonary)	1,226	637
Lethargic encephalitis	3		Typhoid fever	1,967	450
Malaria	5,242	35	Typhus fever	112	31
Measles	2,365	1,006	Undulant fever	1	
Mumps	214	13	Whooping cough	671	88

Vital statistics—Third quarter, 1936.—Following are vital statistics for the third quarter of 1936 in all places in Egypt having a health bureau:

Population	4,710,500
Live births	50,227
Births per 1,000 population	42.6
Stillbirths	1,087
Total deaths	42,015
Deaths per 1,000 population	35.7
Deaths from diarrhea and enteritis under 2 years of age	14,789
Infant mortality per 1,000 births	292

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan-American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		Nov. 1-28, 1936	Nov. 29-Dec 26, 1936	Dec. 27, 1936-Jan. 30, 1937	Jan. 31-Feb. 27, 1937	Week ended— March 1937 6	13	20	27	April 1937 3	10	17	24	May 1937 1	8	15	22	29
India	C	23,017	17,965	20,182	7,736	2,091	2,560	4,295	4,069	5,186	5,386							
	D	11,747	9,506	11,282	4,305	1,098	1,301	2,045	2,044	2,395	2,683							
Assam	C	710	664	585	197	62	64	101	167	236	402	446	739	706	554	503	481	310
	D	318	315	330	80	24	26	42	69	99	138	186	305	289	255	266	248	147
Bassein	C				8	3	9	17	8	8	9	21	48	46	34		4	1
Bombay Presidency	C	2,859	2,367	646	253	28	27	19	24	35	132	164	226	256	613	687		
	D	1,120	1,467	249	142	14	14	7	9	13	57	76	91	121	282	338		
Bombay	C		2									[1] 1		[1] 1				
Calcutta	C	61	61	88	87	16	21	35	34	44	37	49	117	94	136	136	231	135
Central Provinces and Berar	C	922	567	125		2	1	1					5	5	17	23	21	17
Chittagong	C	16	11	3	2				3		1	6	6	[1] 1	16	32	43	51
Madras Presidency	C	10,204	5,588	10,652	4,516	505	689	1,302	690		1,181	1,028	1,061		291	212		
	D	5,161	2,885	5,712	2,514	262	826	610	361		635	572	648		173	117		
Madras	C	57	60	75	25		1	2	2	2	2	1						1
	D	12	21	41	14			1			1							
Negapatam	C		11	22	4	1			1							1		1
	D		7	13	1													
Northwest Frontier Province	C	84	7															
Orissa Province	C	155	994	889	609	137	137	148	180		137	157	74	91	38	29	15	8
Punjab	C	7						1				1	1	2			1	
Rangoon	C	4	2	1	4	2	1				2		4	4	4		1	3
Sind State	C															1		
Tuticorin	C	12	3											[1] 2				
India (French):																		
Chandernagor Territory	C		5	9					3	2	2							
Karikal Province	C	4	96	96	16			2	1									
Pondichery Province	C	10			13	1												
Indochina (see also table below): Cochinchina—																		
Chaudoc	C						P											
Cholon Province	C			1								P						
Vinlong	C		1															
Philippine Islands: Manila	C												1					
	D												1					

Siam:																		
Bangkok	O		2	150	163	87	39	57	93	125	167	305	351	178	84	33	23	20
Provinces	O		196	855	1, 339	275	265	465	480	301	500	448	397	286	213	146	104	47
On vessels:																		
S. S. *Kedah* at Singapore from Penang	O										1							
S. S. *Hellas* at Bangkok from Swatow	O											3						
	D											2						
S. S. *Kedah* at Belawan-Deli	O										1							
S. S. *Ellenga*.[2]																		

Place		December 1936			January 1937			February 1937			March 1937			April 1937			May, 1-10, 1937
		1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	
Indochina (French) (see also table above):																	
Cambodia [3]	O	1									2	6			2		3
	D	1									2	6			2		1
Cochinchina [3]	C		1				1				2				1		
	D		1				1				2				1		

[1] Imported.
[2] During the week ended June 5, 1937, 6 deaths from cholera were reported on the S. S. *Ellenga* at Penang from Negapatam.
[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Jan. 31–Feb. 27, 1937	Week ended— March 1937 6	March 1937 13	March 1937 20	March 1937 27	April 1937 3	April 1937 10	April 1937 17	April 1937 24	May 1937 1	May 1937 8	May 1937 15	May 1937 22	May 1937 29
Algeria: Algiers	C		[2] 1															
Argentina. (See table below.)																		
Bolivia. (See table below.)																		
Brazil. (See table below.)																		
British East Africa:																		
Kenya	C	18	8	20	7	2	1	1			3		2					
Tanganyika	C				84			4	6	8	5	16		1				
Uganda	C	85	52	36	32	5	12	7	17	6	6	7	5	5				
	D	76	50	34	32	4	8	6	17	5	5	7	5	3				
Ceylon:																		
Chilaw District	C																	1
Colombo	C	4	3	3	10	3	1		2					1			1	
	D	3	3	3	9	3	1		2					1			1	
Plague-infected rats		1	4	12	17	2		1			1		1	1				
China:																		
Amoy	C									1	[3] 1							
Fukien Province [4]	D									130								
Hainan Island	C								P									
Hsiatangchi.[5]																		
Dutch East Indies:																		
Java and Madura	C	317	452	583	568	107	119											
	D	315	452	577	569	107	119											
Java—Batavia	C										[6] 1							
Ecuador (see also table below):																		
Babahoyo	C	5	2	3	1													
Plague-infected rats		6																
Bajada del Morro	C	4																
Guayaquil	C	21	13	17	26	7	5	9	12	5	4	7	1	5	3			
	D	14	13	11	11	6	4	6	8	5	4	6	1	2		1		
Plague-infected rats		7	8	10	16	5	7	5	16	13	7	9	8	4	5	10	8	
Playas	C		11	1														
Egypt:																		
Alexandria: Plague-infected rats		P																
Asyut Province	C	1	2	2	1				2	16	18	10	4	7	1	1		
Dakahliya Province	C										1							
Girga Province	C	1				1				1				2		1		

Formosa: Taihoku District	C		1															
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District:																		
Hamakua Mill Sector								1										
Kukaiau				1														
Paauhau Sector [7]		3	5	9	6	1	2	2			1	1	2	2		2		
Pohakea								1										
India	C	2,335	3,029	5,118	4,931	1,843	1,563	1,405	1,169	1,368	1,787	1,639						
	D	717	1,099	2,006	2,528	825	838	701	612	762	946	926						
Bassein	C	1	1	3	7	2	1	2		1		2	5	2		4		1
Plague-infected rats					1	1			1		1	1				2		
Bombay Presidency	C	57	105	139	120	31	19	19	14	30	22	9	7	19	5	4		
	D	35	50	86	62	15	8	8	9	18	10	8	1	8	4	1		
Central Provinces and Berar	C	1,376	1,592	2,022	1,614	806	458	527	422	388	317	213	185	182	71	58	39	13
Karachi	C				7			1	2	2		3		1				
Plague-infected rats													1					
Madras Presidency	C	29	131	97	94	23	32	24	18	30	16	5	2		4	1		
	D	15	80	55	57	8	17	17	12	16	8	6			1			
Punjab	C						1						1	1	1			
Rangoon	C			3	1	1				2	1			1			1	
Sind State	C				6	1	1	2		2	1	3		1		1		
Indochina (see also table below): Bentre	C			1														
Madagascar. (See table below.)																		
Malta	C	6		6									1				1	
	D			1														
Plague-infected rats				1														
Northern Rhodesia	C			8	1													
Peru. (See table below.)																		
Senegal:																		
Dakar	C										1							
Thies	C															2		
Tivaouane	C													1				
Syria: Ras el Ain region.[8]																		
Tunisia: Tunis	C	1	1														1	
Plague-infected rats			3	1								1	16		5			
Union of South Africa (see also table below)	C	3	5	[9] 2	4				[9] 3		[9] 1							

[1] Including plague in the United States and its possessions.
[2] Suspected.
[3] Imported, pneumonic plague.
[4] Under date of June 1, estimated deaths from plague in Province of Fukien, China, reported to be 3,000 to 4,000.
[5] Information dated May 10, states that several hundred deaths from bubonic plague had been reported in Hsiatangchi, China.
[6] Imported.
[7] During the week ended June 19, 1937, 2 plague-infected rats were reported in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory.
[8] During the week ended June 5, 1937, 12 cases of pneumonic plague with 12 deaths were reported in Ras el Ain region, Syria.
[9] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

Place	Nov. 1-28, 1936	Nov. 29-Dec. 26, 1936	Dec. 27, 1936-Jan. 30, 1937	Jan. 31-Feb. 27, 1937	Week ended— March 1937 6	13	20	27	April 1937 3	10	17	24	May 1937 1	8	15	22	29
United States:																	
California: San Bernardino County.[10]																	
Nevada: Douglas County.[11]																	
Oregon:[12]																	
Grant County—Plague-infected ground squirrel															1		
Lake County—Plague-infected fleas.[12]																	
Wallowa County—Plague-infected ground squirrel																	1
Washington: Adams County—Plague-infected fleas and lice.[13]																	
On vessel: S. S. *Magister* at Kingston from Maranhao, Para, and Manaos C								1									

[10] According to information dated Nov. 10, one lot of 31 fleas taken from 24 Fisher squirrels shot in Holcomb Valley in San Bernardino County, has been proved positive for plague by animal inoculation.

[11] During the week ended June 5, 1937, 1 case of plague (provisional diagnosis) was reported in Douglas County, Nev.

[12] During the week ended May 8, plague-infection in a lot of 56 fleas taken from 36 ground squirrels in Lake County, Oreg., was proved by animal inoculation.

[13] During the week ended May 1, plague-infection in a lot of 33 fleas and 3 lice from 21 ground squirrels and in a lot of 18 fleas and 5 lice from 13 ground squirrels in Adams County, Wash., was proved by animal inoculation.

Place		November 1936	December 1936	January 1937	February 1937	March 1937	April 1937
Argentina:							
Cordoba Province	C	4	5	----	----	1	----
Salta Province	C	----	----	2	----	----	----
San Luis Province	C	----	1	----	----	----	----
Bolivia:							
Chuquisaca Department	C	----	----	P	5	----	[14] 2
Oruro Department	C	----	----	----	----	----	[14] 1
Potosi Department	C	----	----	----	----	[14] 3	[14] 1
Brazil:							
Ceara State	C	----	----	1	----	----	----
Parahyba State	C	----	----	4	1	----	----
Pernambuco State	C	----	----	----	2	----	----
Ecuador (see also table above):							
Manabi—							
Bahia	C	----	----	----	4	7	2
Manta	C	----	----	----	8	12	13

Place		November 1936	December 1936	January 1937	February 1937	March 1937	April 1937
Indochina (see also table above):							
Cambodia	C	----	1	----	----	1	4
Cochinchina	C	----	1	1	----	----	----
Madagascar (central region)	C	186	176	[15] 170	[16] 219	----	57
	D	174	167	161	199	----	57
Peru	C	33	16	23	23	28	9
Cajamarca Department	C	9	----	----	----	1	----
Huancabamba Department	C	----	----	----	----	----	3
Lambayeque Department	C	3	1	2	4	----	1
Libertad Department	C	19	14	15	12	12	4
Lima Department	C	2	1	4	5	1	1
Lima City	C	----	----	----	1	----	----
Piura Department	C	----	----	2	2	14	----
Union of South Africa (see also table above)	C	5	2	2	3	3	----

[14] Pneumonic plague.
[15] Includes 44 cases of pneumonic plague.
[16] Includes 66 cases of pneumonic plague.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Jan. 31–Feb. 27, 1937	Week ended— March 1937 6	13	20	27	April 1937 3	10	17	24	May 1937 1	8	15	22	29
Algeria:																		
Algiers Department	C			2											1			
Oran Department	C					2									3			
Southern Territories	C									2								
Angola. (See table below.)																		
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia	C	38	20	14	7	1	2	1	2	3	4	2	6					
Porto Alegre (alastrim)	D		1	1								1	2					
Recife (alastrim)	C	3	15		1	3				1								
Rio de Janeiro	C			3														
British East Africa: Tanganyika	C	207	4	382	122	6	49				55		17	65				
Canada:																		
Alberta	C	4	[1] 4	2	[1] 46						[1] 1							
British Columbia	C			[1] 1														
Manitoba	C								[1] 1									
Saskatchewan	C				[1] 1													
Ceylon: Colombo	C				1													
China:																		
Amoy	C			3				1	2	1		1		1				
Canton	C		2		4		3				3	1			1			
Dairen	C		1	2	6			1	3									
Foochow	C	P	P	P	P	P		P		P		P		P		P		
Hangchow	C		1	5	3			1			1	2						
Hankow	C		5	7	5	1	1	4	2	2	3	5	1	1				
Hong Kong	C			7	5	2	1	1	3	6	18	5	3	7	4	1		4
Macao	C					1		1										
Nanking	C	1	3	2	7	1	1	3	2	1	2							
Shanghai	C	24	98	231	127	25	32	25	14	14	11	11	19	8	11		12	13
Swatow	C						[2] 1	1	1	1	1		2					
Tientsin	C	1	4	2	11		1		4		2	1		1				
Chosen. (See table below.)																		
Colombia: Barranquilla	D	3	7	1	3				2	1								

Dahomey. (See table below.)																		
Dutch East Indies: Java—Surabaya	C			[2] 1														
Ecuador: Guayaquil	C	8		10	33	23 [1]	24	12	14	7	11	7	9	4	6	9	12	
Egypt:																		
Alexandria	C	[2] 1																
Port Said	C												4					
Qena Province	C								1									
Eritrea (see also table below)	C				3	102			1			1	3					
Estonia	C										2							
Ethiopia	C	13																
Finland. (See table below.)																		
France. (See table below.)																		
Gambia:																		
Bathurst	C						[2] 4											
MacCarthy Island	C						4											
Great Britain: England and Wales—																		
Derby	C						1	1										
Lancaster—Failsworth	C			2														
London and Great Towns (Oldham)	C	1	7															
Ripley	C						1											
Greece: Salonika	C	34	38	10	15		6	6	6	6	8	8	8	8				
Guatemala. (See table below.)																		
Honduras: Puerto Castilla	C											1						
India	C	3,559	4,605	10,849	13,761	3,439	3,018	3,358	2,777	3,539	3,450	2,410						
	D	868	1,136	2,740	3,219	894	755	741	615	726	826	494						
Assam	C	36	154	212	220	49	51	29	34	64	51	42	47	88	91	75	66	64
Bassein	C			18														
Bombay Presidency	C	116	170	671	905	145	195	242	200	200	244	251	452	318	286	153		
	D	27	30	99	146	23	38	37	38	39	44	45	70	60	30	35		
Bombay	C	3	7	25	49	13	16	9	25	38	21	33	44	40	34	21	40	30
	D	3	3	17	29	10	14	6	18	19	13	18	18	28	19	14	28	16
Calcutta	C	8	9	29	86	23	21	21	22	17	15	17	8	22	37	20	18	9
	D	2	7	12	34	21	18	13	16	14	16	10	11	16	2	14	11	4
Central Provinces and Berar	C	38	115	235	299	76	64	124	77	136	136	124	109	130	136	45	84	57
Chittagong	C	[2] 2	10	237	208	24	11	13	7	5	[2] 1	5	1	1				
Cochin	C										47			1				2
Karachi	C	[2] 1	8	40	49	20	11	7	2	17	1	5	5	12	2	3		2
Madras Presidency	C	298	161	671	579	236	106	175	115	161	109	140	159		46	27		
	D	59	37	131	84	29	30	41	18	26	16	25	22		8	8		
Madras	C	3	7	3	37	8	3	5	8	7	5		12	9	11	10	12	7
Moulmein	C	12	31	48	64	16	8	12	12	3	2	1	2					
Northwest Frontier Province	C	15	57	125	85	11	15	15	14	11	10	9	19	15	5	1		9
Orissa Province	C		376	681	1,049	186	257	233	172	166	204	131	265	128	150	172		170
Punjab	C	294	499	533	490	249	156	75	72	77	111	107	105	127	55	138	111	
Rangoon	C	11	2	5	14		2	1	2	5	[2] 1	2	1	1		1		1
Sind State	C	52	180	195	184	38	28	77		36	96	38	93	3	58	31		96
Vizagapatam	C				3	1												
India (French): Chandernagor Territory	C						2											
India (Portuguese)	C		2															

[1] For 2 weeks.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Jan. 31–Feb. 27, 1937	Week ended— March 1937 6	13	20	27	April 1937 3	10	17	24	May 1937 1	8	15	22	29
Indochina (see also table below):																		
Pnom-Penh	C	5	1								1						1	
Saigon-Cholon	C			2	2													
Tourane	C			3	3		2		2	1	1	1						
Iran	C	1	1	11	10						2							
Teheran	C	2	1		2		1	1							1			
Iraq	C	6	30	1	1					6			8	1			1	
Baghdad	C													1				
Japan:																		
Kobe	C								[2] 1									
Moji	C							1		2		6	2	1		1	1	
Osaka	C												1					
Tokyo	C	1																
Yokohama	C				1							1						
Mexico (see also table below):																		
Chihuahua	C				3													
Durango	D		1	2	1	4	2	1	3	2		4	2	2	2			1
Guadalajara	D											1			1			1
Mexico, D. F	C	2	2	7	4													
Monterrey	C			2	11	1				3								1
San Luis Potosi	D															1		
Torreon	C	2	3	31	7				1	2	2	5	2		3	6	12	1
Morocco. (See table below.)																		
Nicaragua: Puerto Cabezas	C				2													
Nigeria	C	12	[1] 11	300	19	[2] 321	85						188					
Lagos	C				1							1						
Northern Rhodesia	C	91																
Nyasaland. (See table below.)																		
Palestine. (See table below.)																		
Peru. (See table below.)																		
Poland	C				1													
Portugal (see also table below):																		
Lisbon	C			2	1	1		1				1				1		
Oporto	C			1	1													

Siam: Tak Province	C				26				1		4	1	2					
Sierra Leone	C	16	38	88	12													
Freetown	C		3		1													
Southern Rhodesia	C		10								1							
Sudan (Anglo-Egyptian)	C	113	116	37	75	1	1	5	5			1	1	7	3		1	2
Tunisia	C			1	105													

[1] For 2 weeks. [2] Imported. [3] For 4 weeks.

On vessels:

S. S. *Jaldurga* at Rangoon from Gopalpur	1 case	Dec. 30, 1936
S. S. *Egra* at Rangoon from Calcutta	1 case	Jan. 4, 1937
S. S. *Tango Maru* at Singapore from Japan	1 death	Jan. 16, 1937
S. S. *Juna* at Rangoon from Penang	1 case	Jan. 27, 1937
S. S. *Horai Maru* at Moji from Keelung	2 cases	Jan. 28, 1937
S. S. *Tjibadak* at Surabaya from Shanghai	1 case	Jan. 28, 1937
S. S. *Colorado Springs* at Manila from Shanghai	1 case	Feb. 1, 1937
S. S. *Nikko Maru* at Moji from Tsingtao	1 case	Feb. 7, 1937
S. S. *Bhadravati* at Bombay from Vengurla	1 case	Feb. 18, 1937
S. S. *Nagasaki Maru* at Nagasaki from Shanghai	1 case	Mar. 8, 1937
S. S. *Kiangsu* at Swatow from Bangkok	1 case	Mar. 13, 1937
S. S. *Sumatra* at Calcutta	2 cases	Mar. 21, 1937
S. S. *Englestan* at Rangoon from Chittagong	1 case	Mar. 25, 1937
S. S. *Daviken* at Hong Kong	1 case	Mar. 31, 1937
S. S. *Talma* at Hong Kong	1 case	Apr. 1, 1937
S. S. *Jalagopal* at Rangoon from Chittagong	1 case	Apr. 2, 1937
S. S. *Taksang* at Hong Kong	1 case	Apr. 13, 1937
S. S. *President Hoover* at Yokohama from Honolulu	1 case	Apr 17, 1937
S. S. *Hydri* at Karachi	1 case	Apr. 24, 1937
S. S. *G. G. Pasquier* at Singapore from Saigon	1 case	May 7, 1937

Place		November 1936	December 1936	January 1937	February 1937	March 1937	April 1937
Angola	C	25	24				
Argentina:							
Corrientes Province	C		1				
Entre Rios Province	C	18					
Salta Province	C		2				
Belgian Congo	C	117	98	111	158		
Bolivia	C			28	4	5	25
China: Manchuria—Harbin	C					3	
Chosen	C		2	1	41	58	
Dahomey	C		11			5	
Eritrea (see also table above)	C		1				
Finland	C		1	1	1		
France	C	10				1	
Guatemala	C	1	4	5	2		
Indochina (see also table above)	C	159	219	306	382	505	316
	D	33	38	84	70	97	46
Mexico (see also table above):							
Aguascalientes State—Aguascalientes	C			1	1		
Mexico—Continued.							
Colima State	C				2		
Jalisco State—Guadalajara	C			1	1		
Mexico, D. F	C			12			
Mexico City	D	1	2	5	2		
Morelos State	C			4			
Nayarit State	C			1			
Nuevo Leon State—Monterrey	C				6		
Puebla State—Puebla	C			1			
San Luis Potosi State—San Luis Potosi	C			1	1		
Morocco	C		2	6	6		
Nyasaland	C	5					
Palestine	C			2	8		
Peru	C	13					
Portugal (see also table above)	C	126	162	113	59	27	
	D	5	8	3	6	2	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Nov. 1–28, 1936	Nov. 29–Dec. 26, 1936	Dec. 27, 1936–Jan. 30, 1937	Week ended— February 1937				March 1937				April 1937				May 1937			
					6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22
Algeria:																				
Algiers Department	C	4	19	71		[1] 68	40	20	5	41	14	24	16	19	35	26	17	14	30	
Algiers	C	4	1	1		[1] 2			1	1		1	2		2		1		1	
Constantine Department	C	36	98	159		[1] 98	9	32	36	50	66	73	64	128	70	86	98	47	92	
Bone	C	1		2		[1] 10					3				2	2	1			
Constantine	C	3	3																	
Philippeville	C		1	6							1						1			
Oran Department	C			10			12	52	67		5			2	2	20	1	3		
Southern Territories	C			5		3	6		2						1					
Arabia: Aden	C								[2] 1											
Australia: Sydney	C	1										1								
Bolivia. (See table below.)																				
Bulgaria. (See table below.)																				
Chile	C	435	385	401	60	60	39	67	53					[3] 214						
Concepcion Province	C				6	5	5	2	3					[3] 17						
Santiago Province	C	[1] 87	242		25	48	21	36	25					[3] 43						
Valparaiso	C	12	21	10	2	1	3	4	11	11	10	5	9	14	9	7	2	17	13	28
China (see also table below):																				
Dairen	C	1	4	1																
Hankow	C			2																
Shanghai	C								1											
Swatow	C						1													
Tientsin	C			1				1	1						1					
Tsingtao	C		3				1	1								1				
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C		1	10	1	5	3		1	2	1	1	1		1	3	4	4	5	3
Aswan Province	C								1	6					3	2	4			
Asyut Province	C				1		1			5										
Beheira Province	C			8	24	7	29		2	16					20	33	24		27	
Cairo	C	1					1	3	2	5	3	1	3	1	6	4	4	4	6	2
Dakahliya Province	C				5	4	16		7	8					12	26	24		35	
Faiyum Province	C		1	1																
Gharbiya Province	C		3	5	8	3	9		8	4					19	40	40		56	

Girga Province	C		2																	
Minufiya Province	C			1	5	4	11			6					1	10	6		10	
Minya Province	C			1	19	1	1												1	
Port Said	C		2	8	1															
Qena Province	C			1											4	10	26		6	
Sharkiya Province	C			1					1							2	10			
Provinces	C	15	14	114	62	19	69	25	19	50	35	19	24	36	60	123	144	170	150	149
Eritrea: Asmara	C			14		1								2	2	2	3			
France. (See table below.)																				
Greece (see also table below): Salonika	C	4	4	1																
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	7	2	5							1		1							
Hungary	C						7				1	11								1
Iran	C	2	4	7		14	4	1		[2] 1	9	1		6	1			4		
Teheran	C		1	2			3											1		
Iraq:																				
Baghdad	C			1									[3] 5							
Diwaniyeh Province	C																	6		
Kirkuk Province	C											12				8		2		
Kut Province	C													1						
Irish Free State: Kerry County—Cahercriveen	C							4					4							
Italy: Catania	C	1																		
Latvia. (See table below.)																				
Lithuania. (See table below.)																				
Mexico (see also table below):																				
Mexico, D. F.	C	7	4	12	2	8	8	2												
San Luis Potosi	D	1	1	2																
Torreon	C													1						
Morocco (see also table below)	C		1	5	6	6	3	7	5	7	7	5	30	28	23	39	69	65	70	47
Palestine:																				
Haifa	C	7	11	3		1			1					1			1	1		2
Jaffa	C	7	8	2					1	1			2	1		1	1		2	1
Peru. (See table below.)																				
Poland	C	131	175	399	88	88	146	103	101	140	100	121	161	109	136	163	158	132	205	
	D	6	13	22	6	5	7	8	7	7	13	6	9	12	7	12	9	11	10	
Rumania. (See table below.)																				
Sierra Leone: Freetown	C	1		1		1														
Straits Settlements: Singapore	C			1																
Sudan (Anglo-Egyptian)	C		8																	
Syria	C													1						
Trans-Jordan	C						3		1					1	2		3			
Tunisia:																				
Tunis	C	3		7	2	3			2		1	1		1	3		2	3	9	1
Provinces	C	43	54	214	50		94	103	138	119	168	125	79	102	133	114	90	166	133	133
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessel: At Santos	C										P									

[1] For 2 weeks.
[2] Imported.
[3] For 5 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

Place		November 1936	December 1936	January 1937	February 1937	March 1937	April 1937
Bolivia	C			24	25	30	48
Bulgaria	C		19	19			
China: Manchuria—Harbin	C	1	7	8	35	58	
Chosen	C	30	28	88	149	154	
Czechoslovakia	C		3	15	12	33	25
France	C	1	1				
Greece (see also table above)	C	11	2	7	2	4	
Guatemala	C	33	28	29	19	4	13
Latvia	C					1	1
Lithuania	C	2	3	13	10	23	
Mexico (see also table above):							
Aguascalientes State: Aguascalientes	C			2	3		
Mexico State	C			8			
	D			1			
Mexico, D. F.	C			14	18		
Mexico City	D	2	5	6	6		
Mexico—Continued							
Oaxaca State	C				2		
Puebla State: Puebla	C		9	7	3		
Queretaro State	C			1	2		
San Luis Potosi State: San Luis Potosi	C	5	7	7			
Morocco (see also table above)	C	1	2	11	22	27	
Peru	C	60	52				
Rumania	C	178	380	941	1,018	917	
Turkey	C	18	21	24	50	68	39
Istanbul	C	4	1	7	3		3
Union of South Africa:							
Cape Province	C	74	61	52	12	38	
Natal	C	19	4	4	1	1	
Orange Free State	C	9	8	5	11	5	
Transvaal	C	11	6	13	1	2	
Yugoslavia	C	7	40	159	125		

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Nov. 1-28, 1936	Nov. 29-Dec. 26, 1936	Dec. 27, 1936-Jan. 30, 1937	Week ended— February 1937: 6	Feb. 13	Feb. 20	Feb. 27	March 1937: 6	Mar. 13	Mar. 20	Mar. 27	April 1937: 3	Apr. 10	Apr. 17	Apr. 24	May 1937: 1	May 8	May 15	May 22	May 29
Brazil:[1]																					
Acre Territory	D			1	1																
Matto Grosso State[1]	C		1		2	13	4	1	1												
	D			3	1	2	2	1			1	2					2	1			
Minas Geraes State[1]	C			1	1	1															
	D			1	1	2	4	6	9	5	12	8	3	6	2	1					
Paraná State	C						2														
São Paulo State[1]	C			4		1															
	D			4		1	2	11	9	4	5	[2]17	1								

Colombia	C		8																		
	D		1																		
Barrancabermeja	C				1																
Intendencia of Meta—																					
Acacias	D	1																			
Villavicencio	D	1																			
Dahomey	C	1																			
French Equatorial Africa:																					
Brazzaville	D															1					
Libreville	C										1										
	D					1															
Gold Coast:																					
Aburi	C																	1			
Accra	C			5	1	2															
Apesi [3]	C																				1
Nugo	C																				1
Tamale	C		1																		
Teshi	C			1							1							1			
Ivory Coast:																					
Adzope	C						3														
Agboville	C										1										
Nigeria:																					
Calabar	C	1																			
Maiduguri	D	1																			
Uyo	C		1																		
Peru: Perene region (Pampa Whaley)	C												[4] 10	[4] 13							
	D												5	3							
Senegal:																					
Bambey	C	1																			
Dakar	C																		[5] 1		
Diakhao	C										1						1				
Fatick.[6]																					
Malem Hodar	C																				1
M'Bour	C	[5] 1																			
Thies Circle:																					
Khombole	C	1												1							
Thies	C	[5] 1																			
Tilmaka	C													1						1	
Tivaouane	C													1							
Sudan (French): Mahina	C																	[5] 1			

[1] See also reports of yellow fever in Brazil on pp. 463, 536, 657, 683, 762, and 818, of the PUBLIC HEALTH REPORTS.
[2] For 3 weeks.
[3] During the week ended June 12, 1937, 2 cases of yellow fever with 1 death were reported in Apesi, Gold Coast.
[4] Jungle type.
[5] Suspected.
[6] The case of yellow fever reported in Fatick, Senegal, on p. 722 of PUBLIC HEALTH REPORTS of May 28, 1937, has not been confirmed.

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